Pioneer sound.vision.soul

Service Manual

ORDER NO.
RRV3530

DVD RECORDER

DVR-745H-S
DVR-645H-S

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Model	Type	Power Requirement	Region No.	Serial No. Please confirm 3rd & 4th alphabetical letters.
DVR-745H-S	TFXV	AC 110 V to 240 V	3	&&DL######$$
DVR-645H-S	TFXV	AC 110 V to 240 V	3	&&DL######$$

● **This service manual should be used together with the following manual(s):**

Model	Order No.	Remarks
DVR-645H-S/WYXV5	RRV3503	

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1. CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Screws adjacent to ▼ mark on product are used for disassembly.*
- *Reference Nos. indicate the pages and Nos. in the service manual for the base model.*
- *For the applying amount of lubricants or glue, follow the instructions in this manual. (In the case of no amount instructions, apply as you think it appropriate.)*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω → 56 × 10¹ → 561 ..... RD1/4PU 5 6 1 J
47k Ω → 47 × 10³ → 473 ..... RD1/4PU 4 7 3 J
0.5 Ω → R50 ..... RN2H R 5 0 K
1 Ω → 1R0 ..... RS1P 1 R 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 ..... RN1/4PC 5 6 2 1 F

■ CONTRAST TABLE

DVR-745H-S/TFXV, DVR-645H-S/TFXV and DVR-645H-S/WYXV5 are constructed the same except for the following :

Ref. No.	Mark	Symbol and Description	Part No. DVR-645H-S /WYXV5	Part No. DVR-745H-S /TFXV	Part No. DVR-645H-S /TFXV	Remarks
		PCB ASSEMBLIES				
P11- 1		1..SCRB ASSY	VWV2269	Not used	Not used	
	NSP	1..TUJB ASSY	VWM2408	VWM2421	VWM2421	
	NSP	2..TUJB (AI)	VWV2264	VWV2273	VWV2273	
P11- 2		3..TUJB ASSY (for Service)	VXX3183	VXX3186	VXX3186	
P11- 9	⚠	1..POWER SUPPLY UNIT	VWR1399	VWR1400	VWR1400	
		PACKING SECTION				
P9- 1	⚠	Power Cord	ADG1127	ADG7097	ADG7097	
P9- 2		RF Antenna Cable	VDE1075	VDE1088	VDE1088	
P9- 4		G-Link Cable	VDX1010	Not used	Not used	
P9- 6	NSP	Warranty Card	ARY7065	Not used	Not used	
P9-12		Packing Case	VHG2763	VHG2769	VHG2768	
P9-14		WEEE Label	VRW2231	Not used	Not used	
P9-15		Remote Control Unit	VXX3129	VXX2963	VXX2963	
P9-16		Battery Cover	VZN1004	AZA7424	AZA7424	
P9-17		Top Cover	VZN1009	Not used	Not used	
		Operating Instructions (English)	Not used	VRB1453	VRB1453	
		Operating Instructions (Chinese)	Not used	VRC1371	VRC1371	
P9-20		Operating Instructions (French)	VRC1366	Not used	Not used	
P9-21		Operating Instructions (German)	VRC1367	Not used	Not used	
P9-22		Operating Instructions (Italian)	VRC1368	Not used	Not used	
P6-23		Operating Instructions (Dutch)	VRC1369	Not used	Not used	
P6-24		Operating Instructions (Spanish)	VRC1370	Not used	Not used	
		EXTERIOR SECTION				
P11-10		HDD 250G ST3250823 S	VXF1082	Not used	VXF1082	
P11-10		HDD 400G ST3400832 S	Not used	VXF1121	Not used	
P11-17		Flexible Cable (23P)	VDA2115	VDA2113	VDA2113	
P11-18		Flexible Cable (29P)	VDA2117	Not used	Not used	
P11-19		Flexible Cable (35P)	VDA2118	VDA2114	VDA2114	
P11-24	NSP	PC Support	VEC1749	Not used	Not used	
P11-25		Rear Panel	VNA2945	VNA2949	VNA2948	
P11-33		Rubber Spacer	VEB1378	Not used	Not used	
		FRONT PANELSECTION				
P15- 8		Center Lens	VNK6119	VNK6120	VNK6119	
P15-14		FL Lens PTD	VXA2826	VXA2838	VXA2826	
P15-15		Door PTD	VXA2823	VXA2836	VXA2824	
		Hologram Label	Not used	VRW2170	Not used	Front Panel

Notes : • For PCB ASSEMBLIES, Refer to “PCB PARTS LIST”, “3. SCHEMATIC DIAGRAM” and “4. PCB CONNECTION DIAGRAM”.

■ PCB PARTS LIST

Mark	No.	Description	Part No.

AF TUJB ASSY

SEMICONDUCTORS

	IC0201	BD3823FV
	IC0102	BD4846G
	IC0501	BH7868FS
⚠	IC1001, IC5001	CEK1278
	IC0301	LA73031V
	IC0101	PMC016A8
	Q0403	2SA1036K
	Q0304, Q0305, Q0351, Q0361, Q0603	2SA1576A
	Q0405, Q0406	2SC2411K
	Q0362, Q0402, Q0416	2SC4081
	Q0415	2SC5876
	Q0101	2SD2114K
	Q0511	DTA124EUA
	Q0115, Q0404, Q0512	DTC124EUA
	Q0401	HN1A01FU
	Q0514, Q0515	HN1C03FU
	Q0503	UMD2N
	Q0411	UMF21N
	Q0410	UMF23N
	D0118	1SR154-400
	D0105	1SS352
	D0102, D0107, D0108, D0114, D0116	1SS355
	D0401-D0403, D0506, D0507	1SS355

COILS AND FILTERS

	L0102	ATH1109
	L0602, L0603, L0621	CTF1306
	L0402	CTF1399
	L0302	LCYA101J2520
	L0104	LCYA120J2520
	L0401	LRCA331J

CAPACITORS

	C0353, C0364	CCSRCH101J50
	C0117, C0118, C0122, C0126	CCSRCH120J50
	C0329	CCSRCH181J50
	C0605, C0606	CCSRCH330J50
	C0140	CCSRCH331J50
	C0102, C0330	CCSRCH471J50
	C0175	CCSRCH681J50
	C0167	CEAL220M6R3
	C0128	CEAL2R2M50
	C0206, C0208, C0215-C0220	CEAT100M50
	C0223, C0224, C0226	CEAT100M50
	C0427	CEAL100M50
	C0225, C0415, C0419, C0429	CEAT101M10
	C0221, C0409	CEAT101M16
	C0517-C0519, C0602	CEAT102M6R3
	C0532	CEAT1R0M50
	C0528	CEAT220M50
	C0548	CEAT221M6R3
	C0549, C0550	CEAT470M16
	C0105	CEAT471M16
	C0307, C0440, C0520, C0521	CEAT471M6R3
	C0405	CKSQYF105Z50
	C0202, C0204, C0507	CKSRYB103K50
	C0301-C0305, C0309-C0314	CKSRYB104K16
	C0178, C0402, C0412	CKSRYB105K16
	C0130, C0320, C0351, C0352	CKSRYB105K6R3
	C0362, C0363, C0508, C0509	CKSRYB105K6R3
	C0511, C0512	CKSRYB105K6R3
	C0601	CKSRYB222K50
	C0623, C0624	CKSRYB472K50
	C0103, C0104, C0109-C0111, C0116	CKSRYF104Z25
	C0119, C0125, C0132, C0139, C0170	CKSRYF104Z25
	C0176, C0211, C0212, C0222, C0306	CKSRYF104Z25
	C0308, C0315, C0317, C0404, C0432	CKSRYF104Z25
	C0504, C0505, C0513, C0522, C0523	CKSRYF104Z25
	C0328	CKSRYF105Z10

RESISTORS

	R0172, R0173	RD1/4PU333J
	R0174	RD1/4PU473J
	R0419, R0506	RS1/10S0R0J
	R0420, R0421	RS1/10S120J
	R0240	RS1/10S330J
	R0422	RS1/10S8R2J
	R0451	RS1/16S1003F
	R0452	RS1/16S2202F
	R0201, R0202, R0208-R0211	RS1/16S75R0F
	R0302-R0304, R0520-R0523	RS1/16S75R0F
	R0525, R0526, R0529, R0530, R0532	RS1/16S75R0F
	Other Resistors	RS1/16S###J

OTHERS

	CN0101 23P FFC CONNECTOR	9604S-23C
	CN0103 KR CONNECTOR	B2B-PH-K-S
	CN0202 KE CONNECTOR	B5B-PH-K-S
	JA0102 REMOTE CONTROL JACK	RKN1004
	BT0101 LITHIUM BATTERY	VEM1037
	JA0504 1P JACK (BLACK,NI)	VKB1159
	JA0502 3P JACK	VKB1165
	JA0103 JACK	VKB1183
	JA0503 JACK	VKB1184
	CN0102 9P FFC CONNECTOR	VKN1240
	CN0401 35P FFC CONNECTOR	VKN2025
	KN0101-KN0103 WRAPPING TERMINAL	VNF1084
	KN0106 WRAPPING TERMINAL	VNF1084
	U601 TV TUNER PACK	VXF1103
	X0101	CSS1653

2. GENERAL INFORMATION
2.1 MODEL TYPE SETTING

[Purposes]

When the MAIN Assy and/or TUJB Assy that are(is) commonly used with another model are(is) replaced, they(it) must recognize the model of this unit.

Items to be set: The model number, destination, and region No. must be set.

[Tool to be used]

Remote control unit for servicing
(GGF1381)

[Notes]
- Once the setting has been made, it can never be changed. Be sure to make the setting correctly.
- As this setting resets the Assy(s) in question to the factory-preset status, it is recommended that you obtain the customer's consent beforehand.

[Procedures]

① After power on, the following screen is displayed on TV monitor. Press four digits properly (for example " 0908 ") by using the remote control unit for service, according to the screen information.

```
[Recorder's Model Setting]
 Input the number using the remote for Service.
> - - -
  Input No.     Model
  [ 0808  :  DVR-645H/TF ]
  [ 0908  :  DVR-745H/TF ]
```

② Disconnect then reconnect the AC power cord of the unit. Be careful not to impart vibration to the unit immediately after the AC power cord is disconnected.

③ Reset the recorder to all its factory settings.
(Make sure that the recorder is on. Press and hold ■ (STOP) key and press ⏻ (STANDBY/ON) key on the front panel.)
The recorder turns off with all settings reset.

④ Press [ESC] then [DISP] keys by using the remote control unit for servicing, and then confirm each Model Name (for example " DVR-745H/TF ").

```
DVR-745H/TF       VERSION  : 1.**
  SYSCON   : RELEASE_421
             Rev    :1.13877. 2. 56
TUNERCON   : 483.079                  OK
    DRIVE  : DVD-RW DVR-L11X          OK
             1.05                     OK

   HDD INT : WDC WD800BB-xxJK         80

    TBCON  : 119.00

  DEVICE   : E2R-FE  1.2   FLASH  : 64M
  REGION   : 3             C : * * * * * * * * *
```

⑤ End

A

B

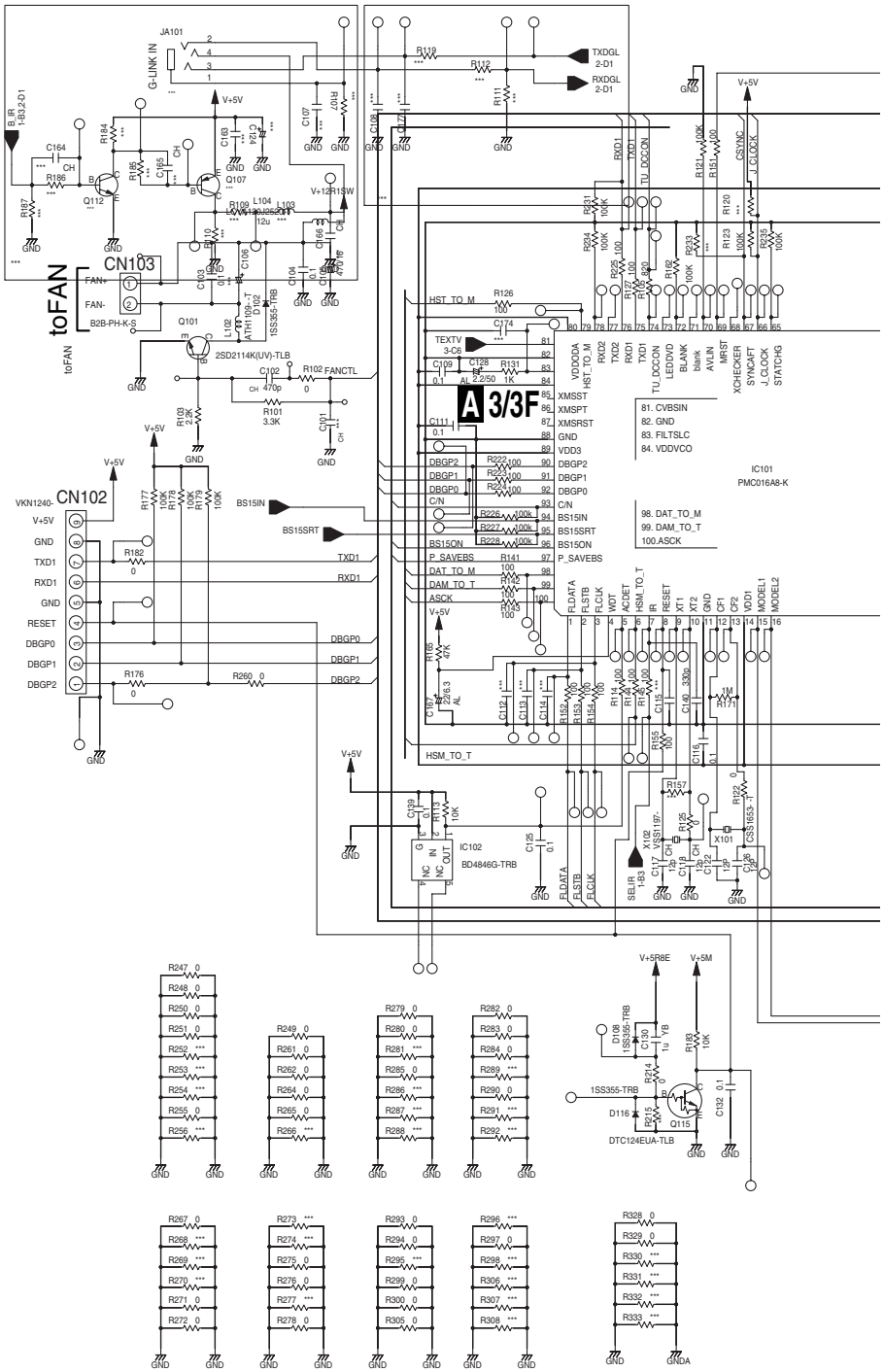
C

D

E

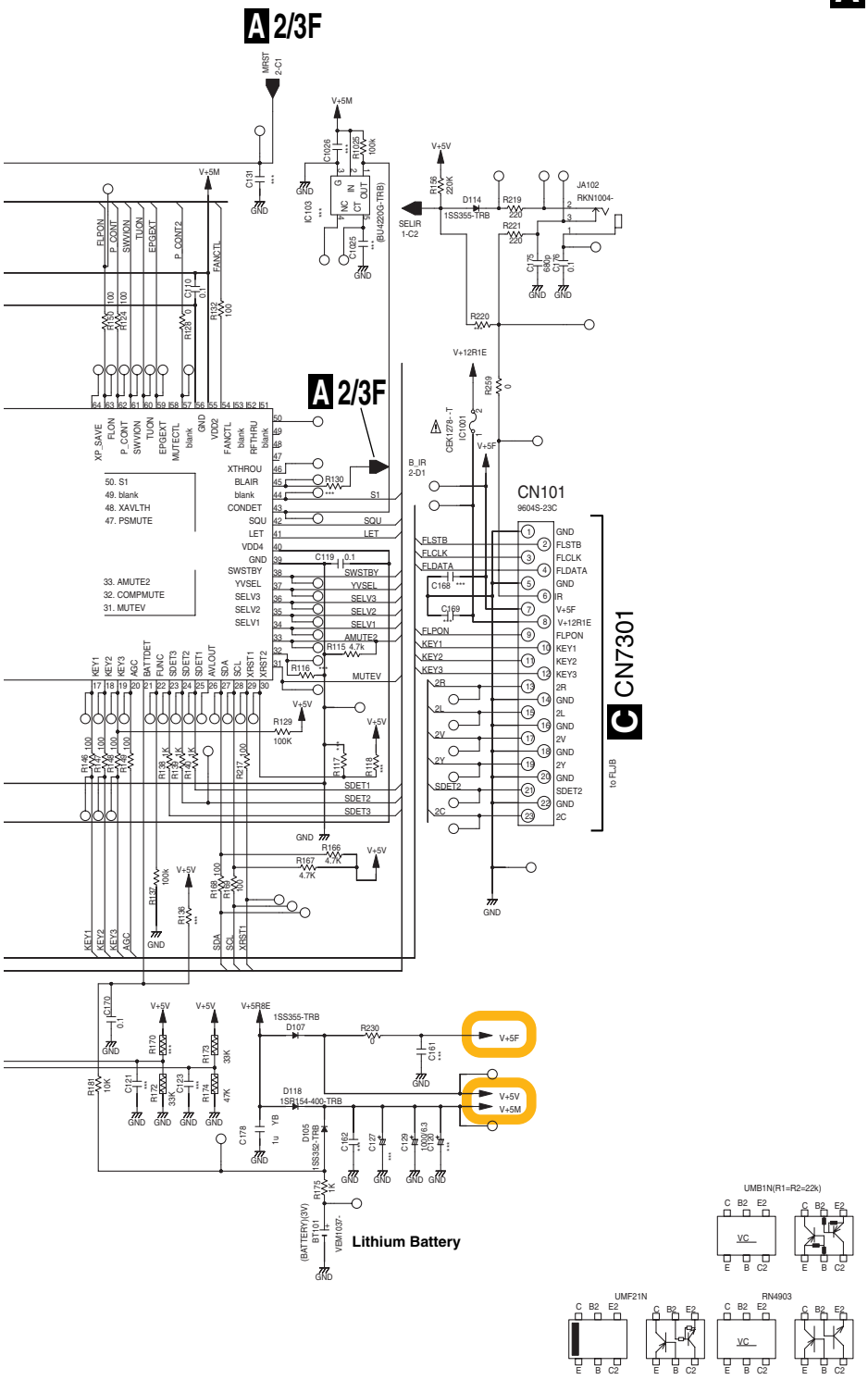
F

3. SCHEMATIC DIAGRAM
3.1 TUJB ASSY (1/3)



A 1/3F

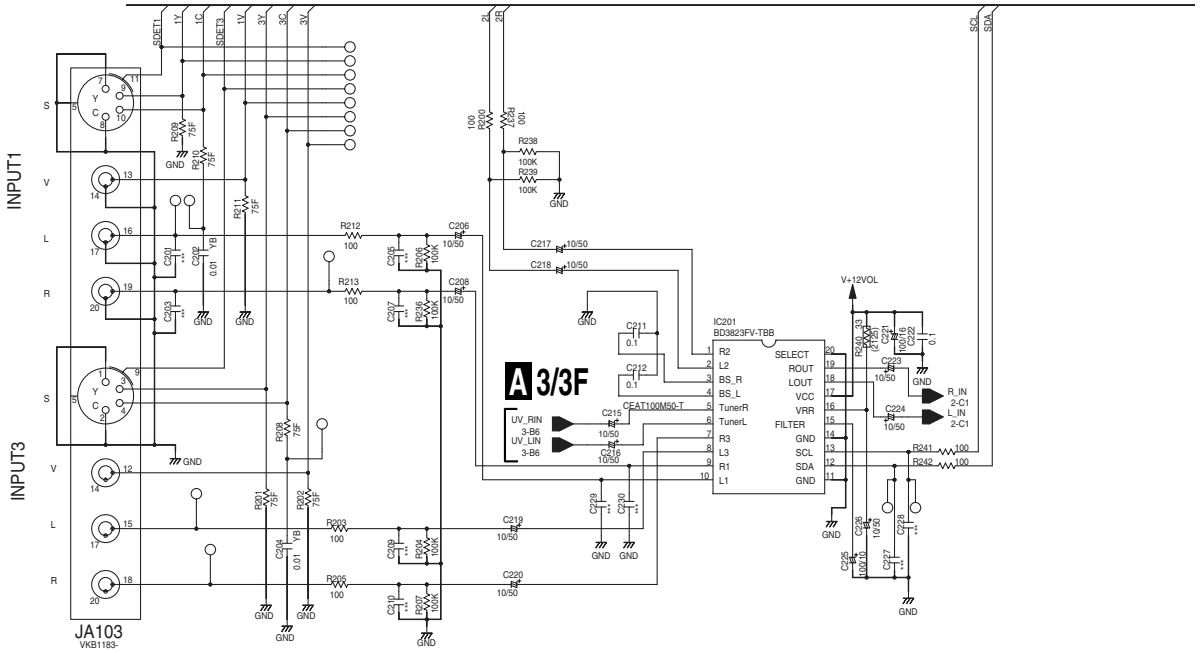
A 1/3F TUJB ASSY (VXX3186)

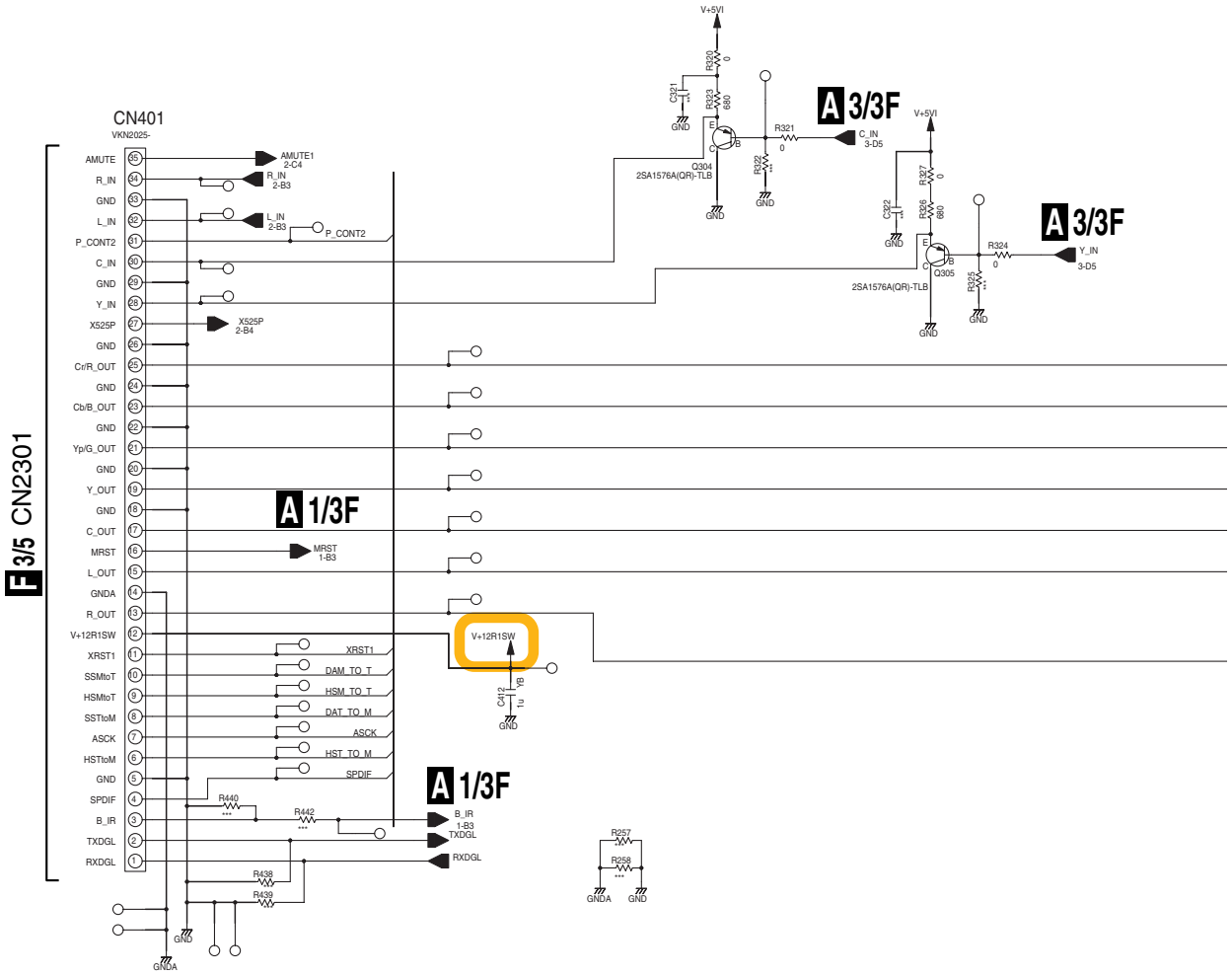


- When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- : The power supply is shown with the marked box.

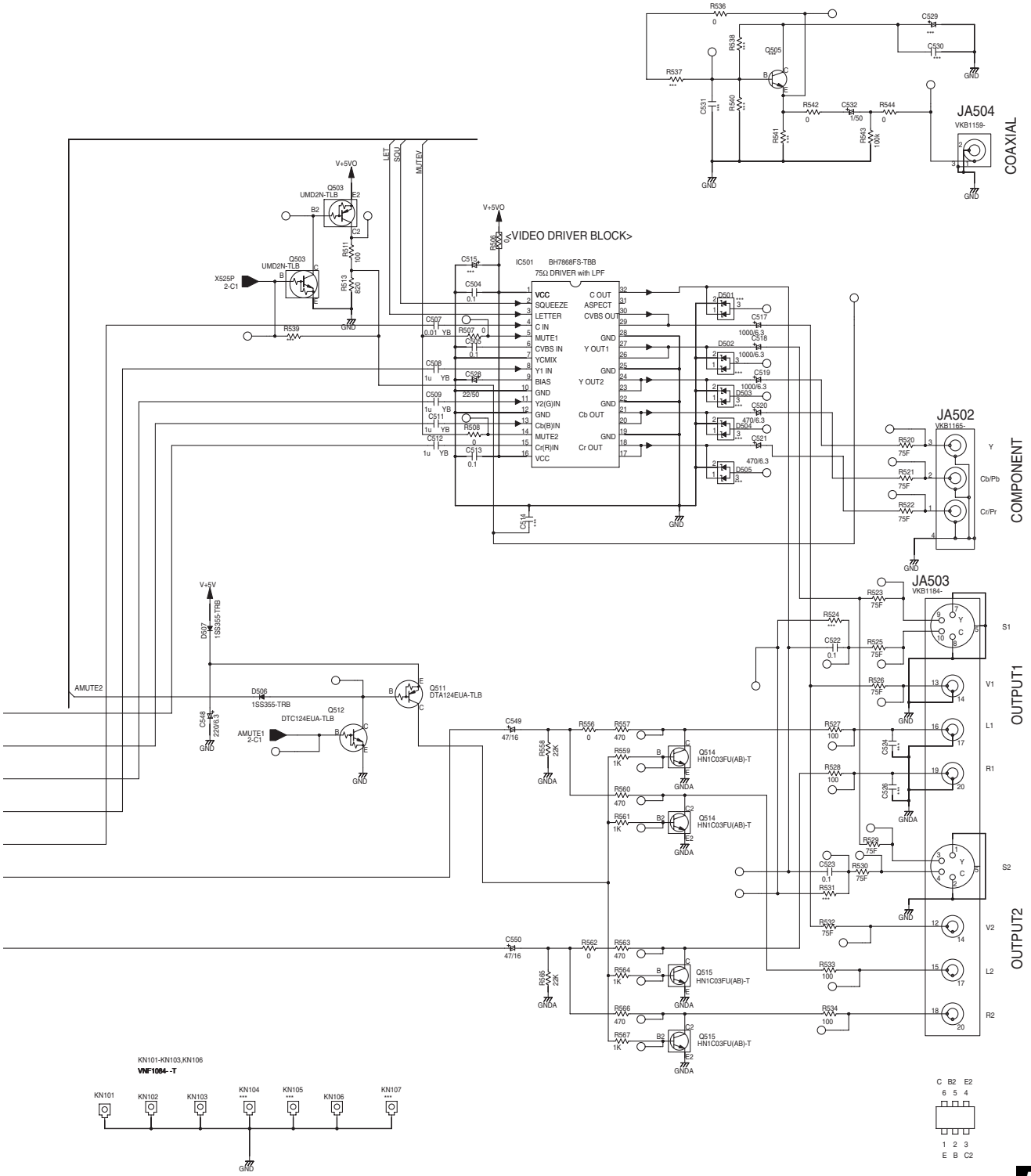
A 1/3F

3.2 TUJB ASSY (2/3)

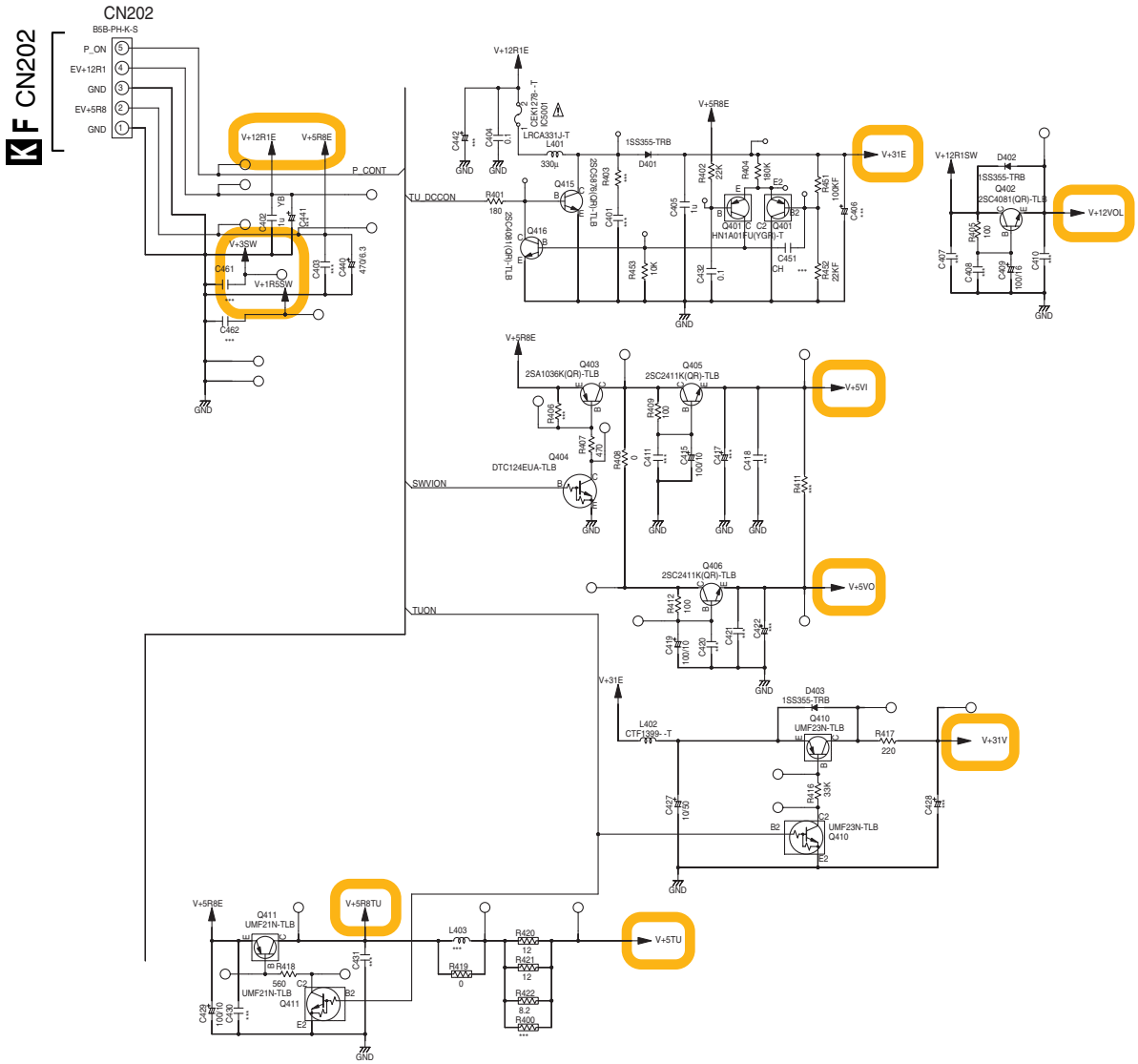




A 2/3F TUJB ASSY (VXX3186)

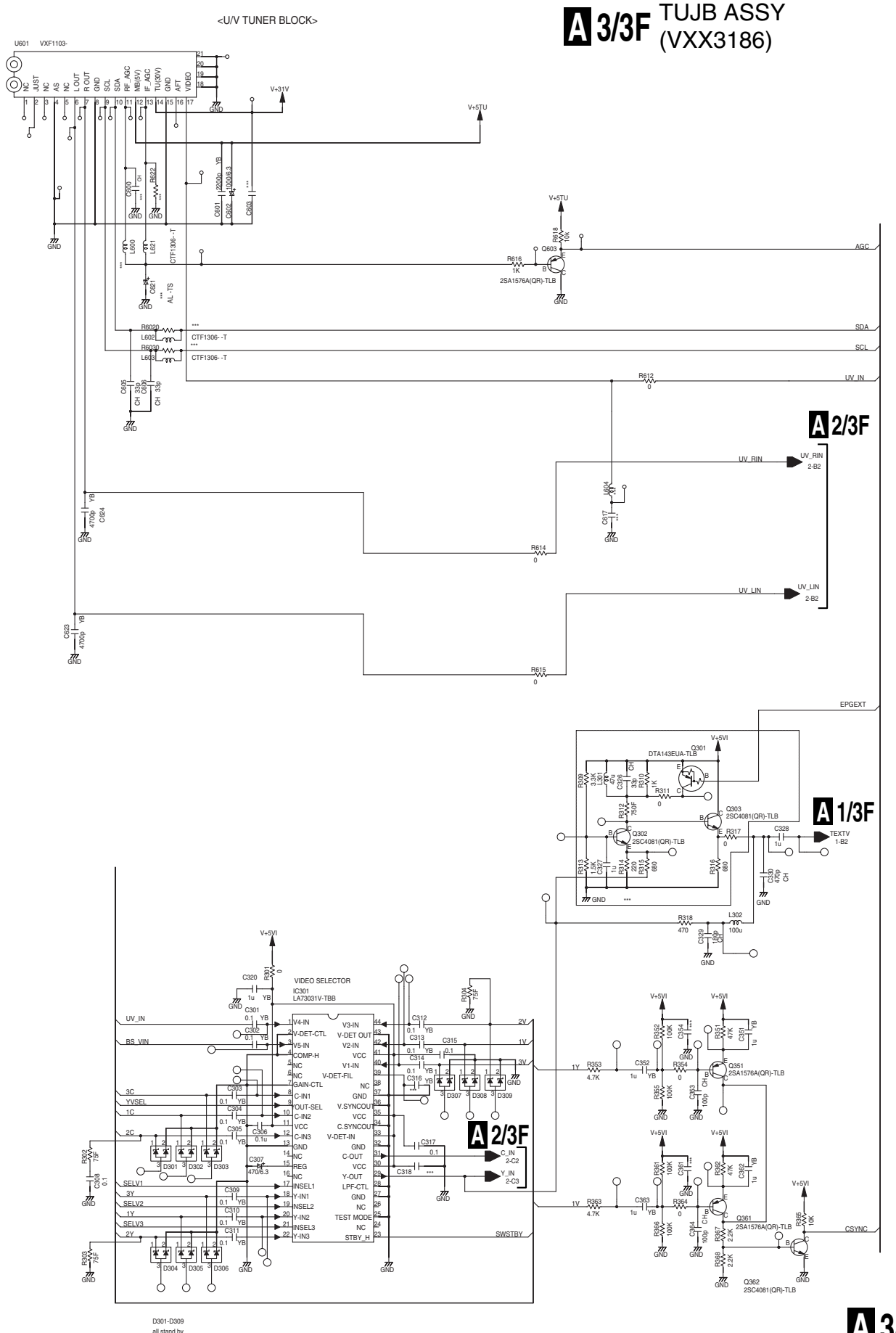


3.3 TUJB ASSY (3/3)



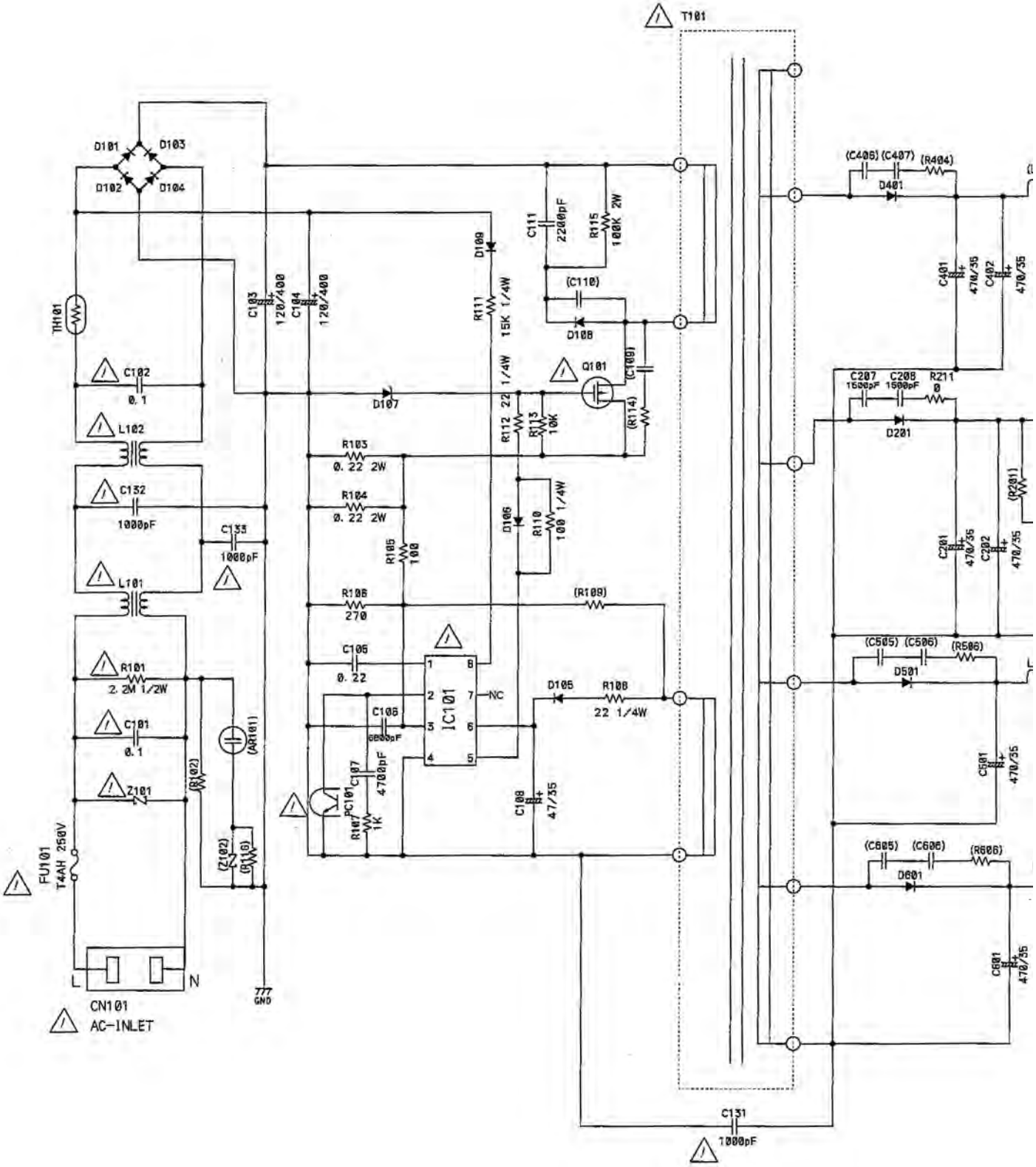
A 3/3F

A 3/3F TUJB ASSY (VXX3186)

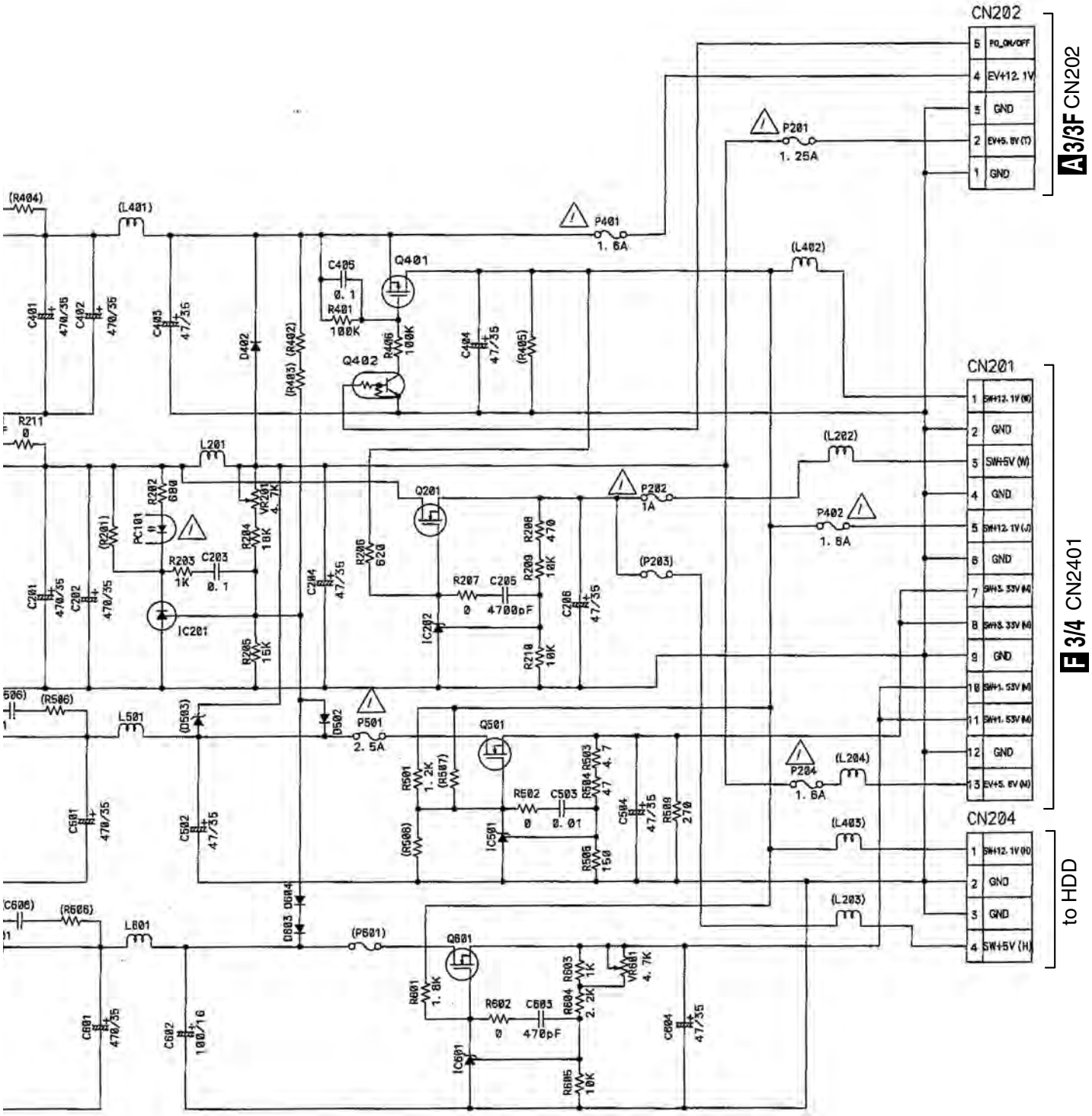


3.4 POWER SUPPLY UNIT

KF POWER SUPPLY UNIT (VWR1400)



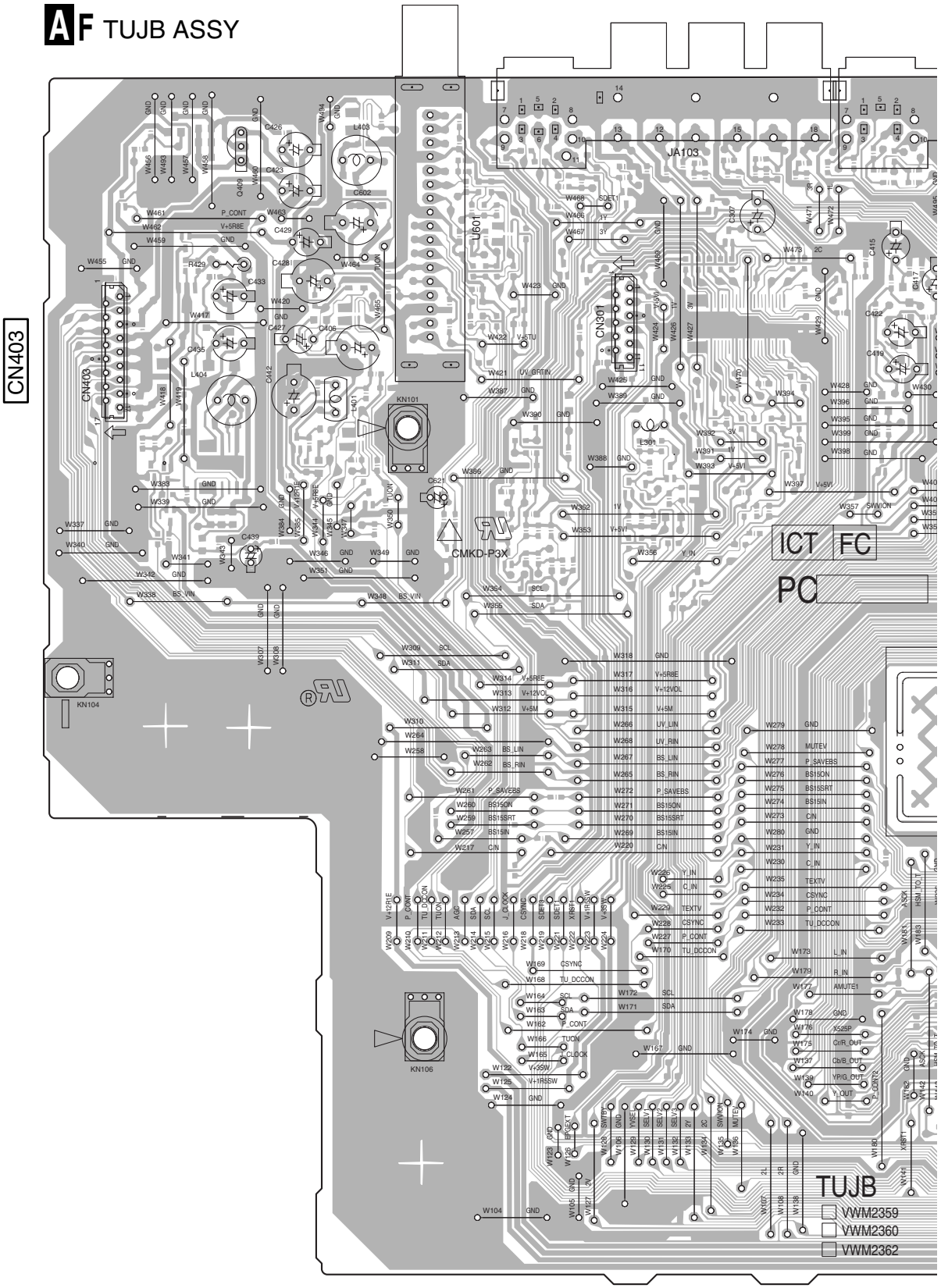
Unit	Resistor	Ω/W (under 1/4W for no direction W
	Capacitor	µF/V (under 50V for no direction V


CN202
5 PO_ON/OFF
4 EV+12.1V
3 GND
2 EV+5.0V(T)
1 GND
A 3/3F CN202
P201
1.25A
P401
1.6A
(L402)
C405
0.1
Q401
R401
100K
R406
100K
Q402
C404
47/35
(R405)
D402
(R403)
(R402)
C401
470/35
C402
470/35
C403
47/35
(R404)
(L401)
R211
0
L201
CN201
1 SW+12.1V(W)
2 GND
3 SW+5V(W)
4 GND
5 SW+12.1V(J)
6 GND
7 SW+3.3V(M)
8 SW+3.3V(M)
9 GND
10 SW+1.5V(M)
11 SW+1.5V(M)
12 GND
13 EV+5.0V(M)
F 3/4 CN2401
(L202)
P202
1A
P402
1.6A
(P203)
Q201
R202
680
PC101
(R201)
R204
18K
VR201
4.7K
R205
620
R208
470
R209
10K
R203
1K
C203
0.1
R207
0
C205
4700pF
R210
10K
C206
47/35
C204
47/35
C201
470/35
C202
470/35
IC201
IC202
R206
15K
(R506)
L501
D503
D502
P501
2.5A
Q501
R501
1.2K
(R507)
R502
0
C503
0.01
R504
47
R503
4.7
C504
47/35
R508
270
(R508)
IC501
R505
150
C501
470/35
C502
47/35
P204
1.6A
(L204)
(L403)
CN204
1 SW+12.1V(D)
2 GND
3 GND
4 SW+5V(H)
to HDD
(L203)
(C606)
(R606)
L601
D603
D604
(P601)
Q601
R601
1.8K
R602
0
C603
470pF
R603
1K
R604
2.2K
VR601
4.7K
R605
10K
C604
47/35
C601
470/35
C602
100/16
IC601

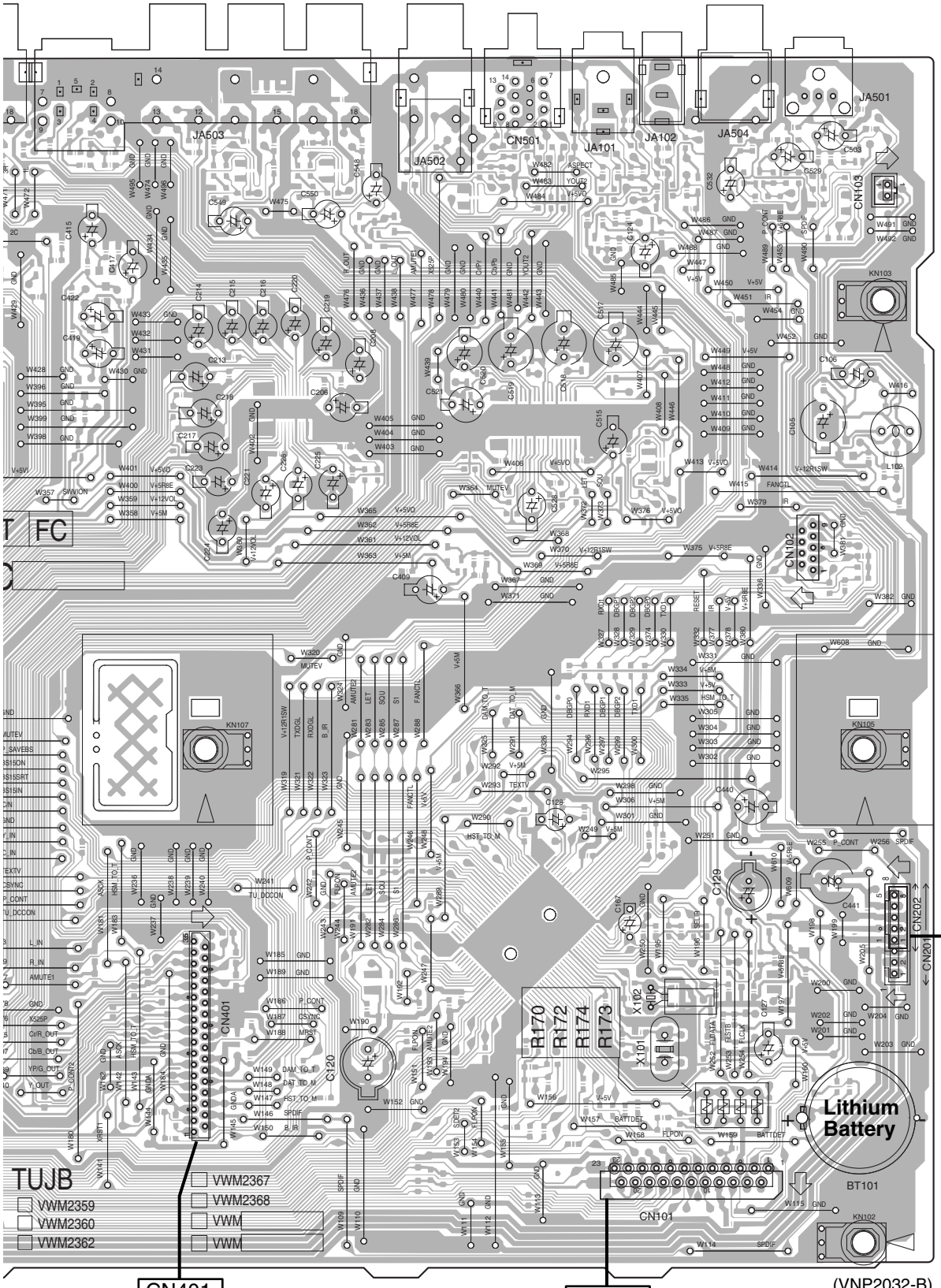
4. PCB CONNECTION DIAGRAM
4.1 TUJB ASSY

SIDE A

AF TUJB ASSY



SIDE A



CN401 → **F** CN2301

CN101 → **C** CN7301

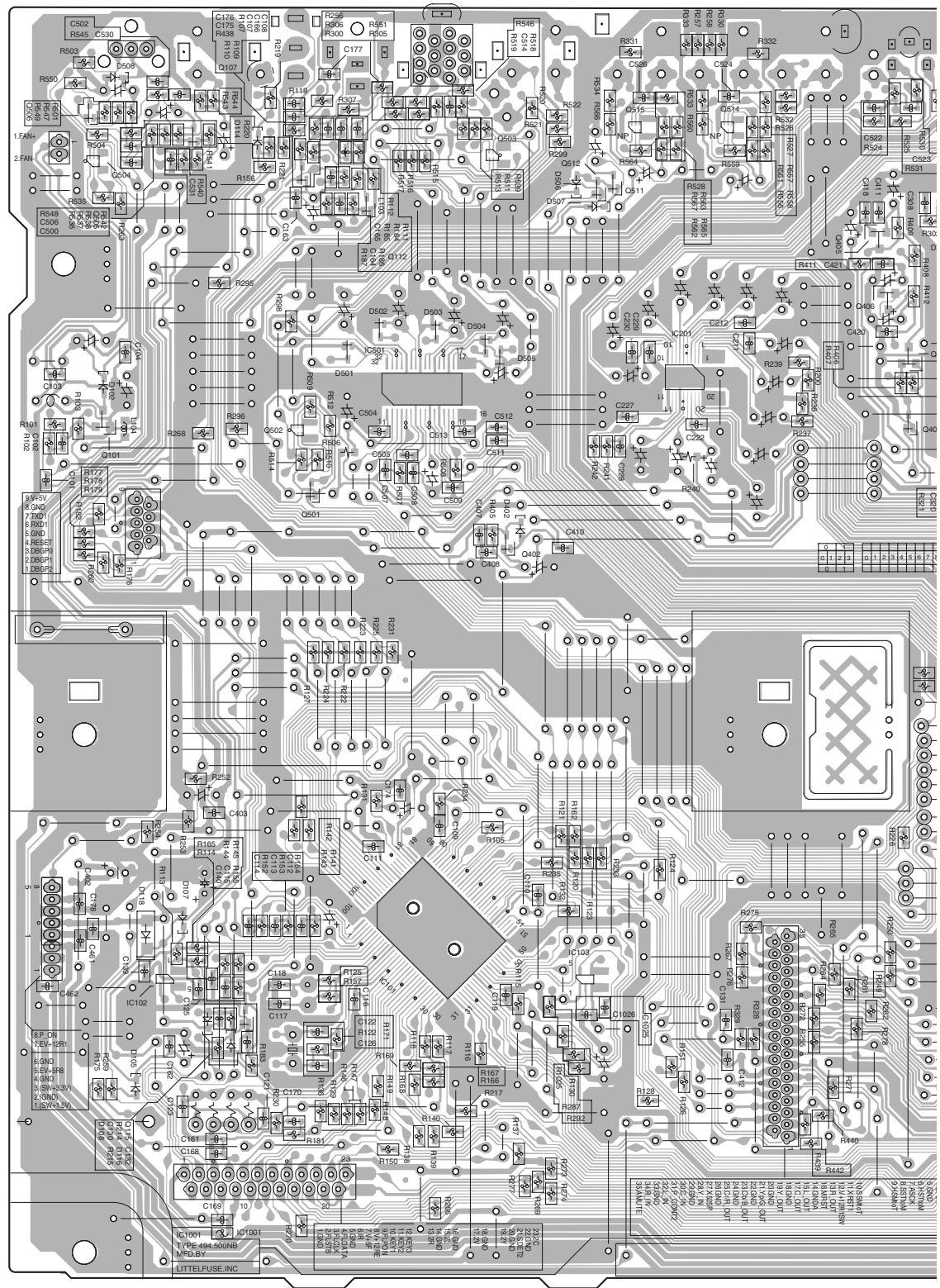
CN202 → **K** CN202

A F

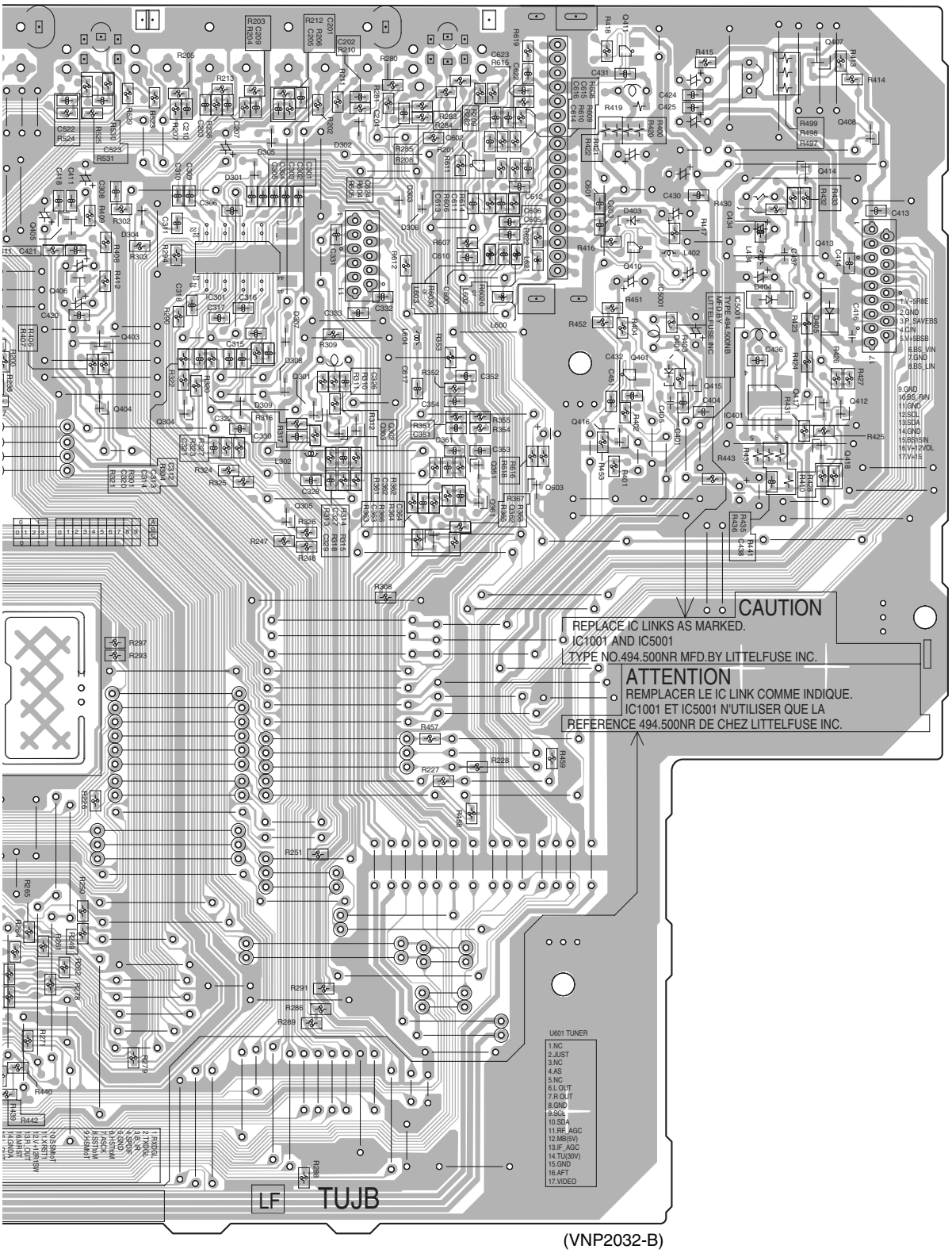
SIDE B

AF TUJB ASSY

IC	Q
	Q411
	Q407
	Q107
	Q506
	Q515 Q514
	Q503 Q408
	Q602
	Q512
	Q504 Q414
	Q511
	Q505
	Q405
	Q112 Q413
	Q410
IC5001	
IC301	Q406
IC201	
IC501	Q403
	Q401
	Q301
	Q415 Q417
	Q412
	Q502 Q404
IC401	Q304 Q303 Q302 Q416
	Q101
	Q351 Q418
	Q501 Q603
	Q361 Q362
	Q305
	Q402
IC103	
IC101	
IC102	
	Q115



SIDE B

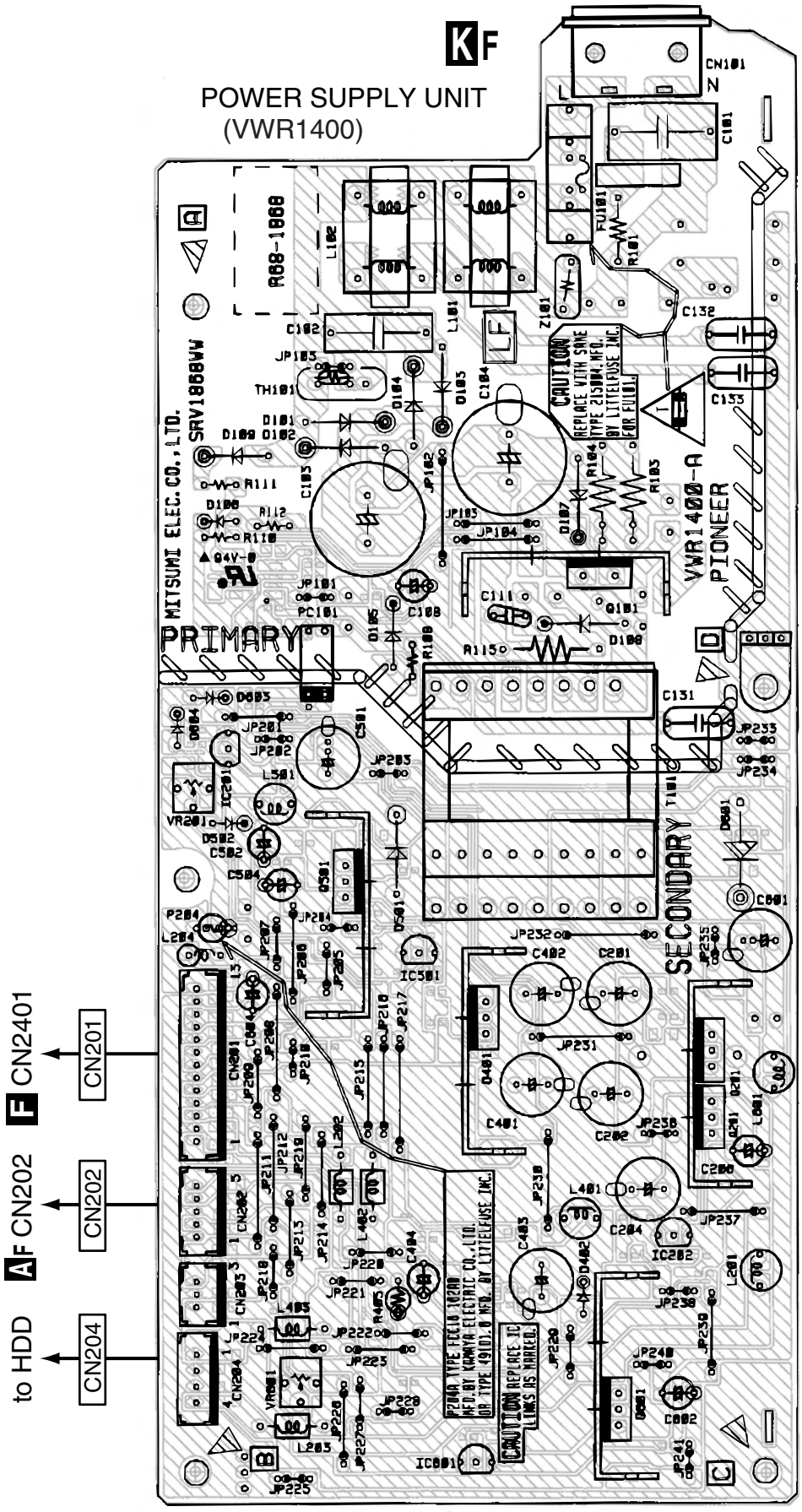


(VNP2032-B)

4.2 POWER SUPPLY UNIT

SIDE A

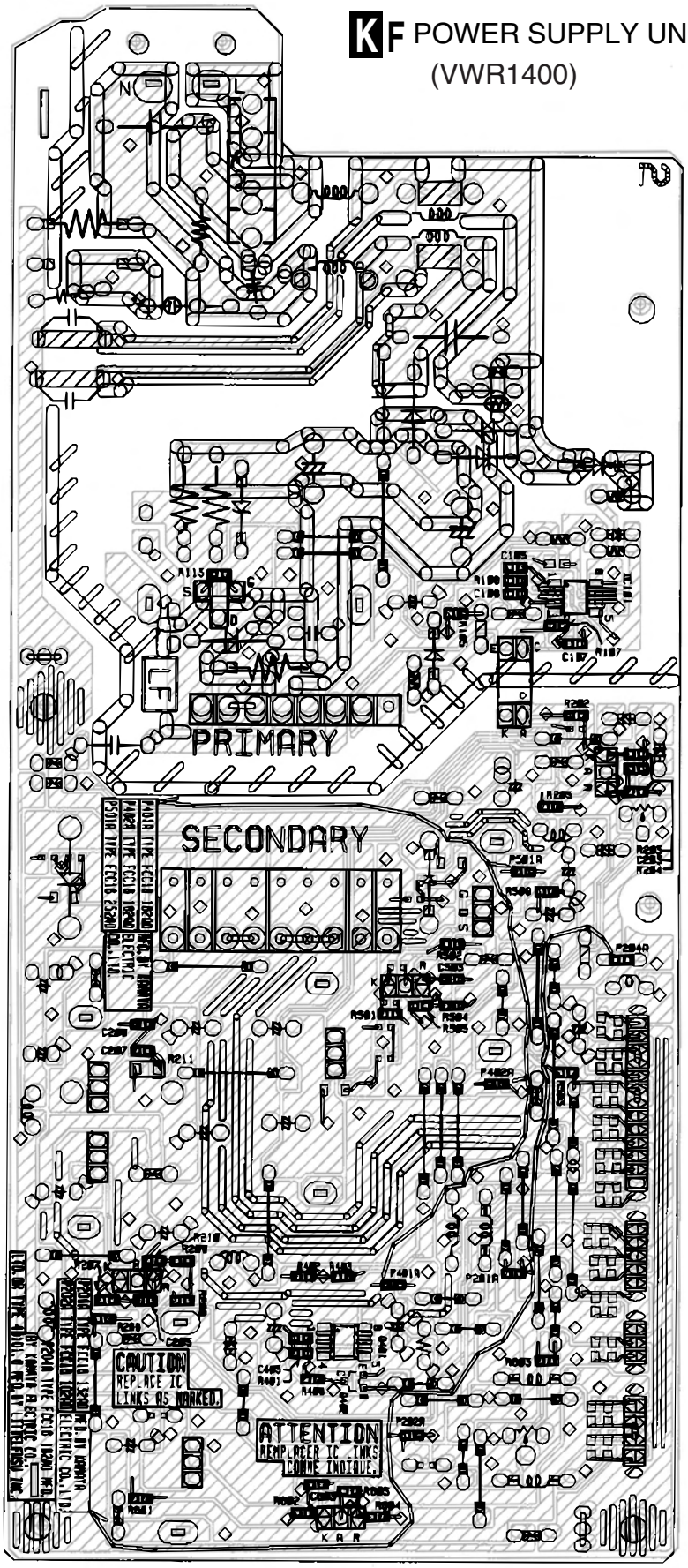
SIDE A



SIDE B

SIDE B

KF POWER SUPPLY UNIT
(VWR1400)



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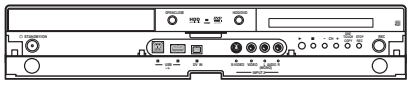


DVR-645H-S

ORDER NO.
RRV3503

DVD RECORDER

DVR-645H-S
DVR-545H-S

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Model	Type	Power Requirement	Region No.	Serial No. Please confirm 3rd & 4th alphabetical letters.
DVR-645H-S	WYXV5	AC220 to 240V	2	&&DL######$$
DVR-645H-S	WYXK5	AC220 to 240V	2	&&UK######$$
DVR-545H-S	WYXV5	AC220 to 240V	2	&&DL######$$
DVR-545H-S	WYXK5	AC220 to 240V	2	&&UK######$$

- **When servicing this model, some service procedures may reset the customer settings to the factory default settings. Make sure to explain this to the customer.**

An HDD (Hard Disc Drive) is mounted in this product.
The HDD is a precision instrument very vulnerable to shock and electrostatic charges. Please read "7.3 Cautions on Handling the HDD" in this manual and exercise sufficient caution when handling the HDD itself, as well as the product with the HDD built in.
When an HDD becomes defective and inoperable, restoration of the user's data recorded on the HDD, or copying of the user's recorded data to other media (such as a new HDD) is totally impossible. Before servicing, OBTAIN THE USER'S PRIOR CONSENT to that effect.
The user must be made aware that all recorded data are deleted if the HDD is intialized.

For details, refer to "Important Check Points for Good Servicing" .

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS (USA) INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER EUROPE NV Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936
ⓒ**PIONEER CORPORATION 2006**

T-ZZV OCT. 2006 printed in Japan

SAFETY INFORMATION

■ LABEL CHECK

IMPORTANT

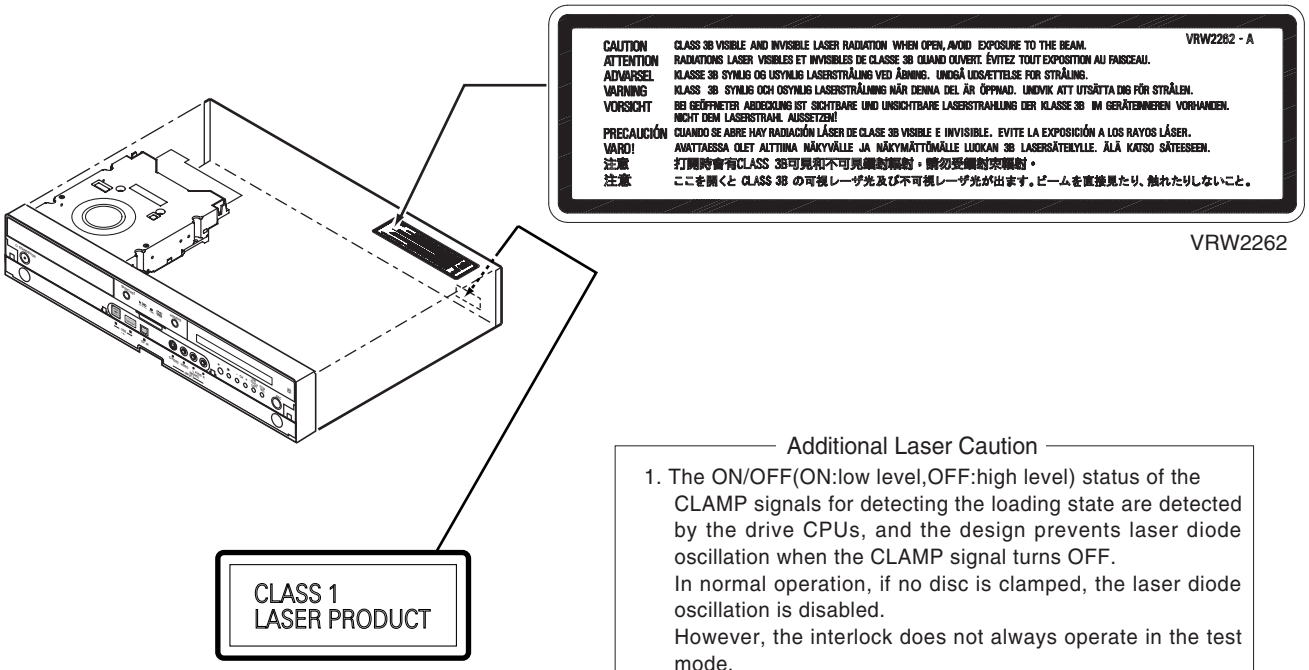
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS

MAXIMUM OUTPUT POWER: 100 mW
WAVELENGTH: 654 - 662 nm

LASER DIODE CHARACTERISTICS

MAXIMUM OUTPUT POWER: 5 mW
WAVELENGTH: 770 - 810 nm


VRW2262 - A
CAUTION CLASS 3B VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN, AVOID EXPOSURE TO THE BEAM.
ATTENTION RADIATIONS LASER VISIBLES ET INVISIBLES DE CLASSE 3B QUAND OUVERT. ÉVITEZ TOUT EXPOSITION AU FAISCEAU.
ADVARSEL KLASSE 3B SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARNING KLASS 3B SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. UNDVIK ATT UTSÄTTA DIG FÖR STRÅLEN.
VORSICHT BEI GEÖFFNETER ABDECKUNG IST SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG DER KLASSE 3B IM GERÄTEINNEREN VORHANDEN. NICHT DEM LASERSTRAHL AUSSETZEN!
PRECAUCIÓN CUANDO SE ABRE HAY RADIACIÓN LÁSER DE CLASE 3B VISIBLE E INVISIBLE. EVITE LA EXPOSICIÓN A LOS RAYOS LÁSER.
VARO! AVATTAESSA OLET ALTTIINA NÄKYVÄLLE JA NÄKYMÄTTÖMÄLLE LUOKAN 3B LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
注意 打開時會有CLASS 3B可見和不可見鐳射輻射。開啟受鐳射束輻射。
注意 ここを開くと CLASS 3B の可視レーザ光及び不可視レーザ光が出ます。ビームを直接見たり、触れたりしないこと。

VRW2262

Additional Laser Caution

1. The ON/OFF(ON:low level,OFF:high level) status of the CLAMP signals for detecting the loading state are detected by the drive CPUs, and the design prevents laser diode oscillation when the CLAMP signal turns OFF.
   In normal operation, if no disc is clamped, the laser diode oscillation is disabled.
   However, the interlock does not always operate in the test mode.

2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 3A laser beam.

[Important Check Points for Good Servicing]

In this manual, procedures that must be performed during repairs are marked with the below symbol.
Please be sure to confirm and follow these procedures.

1. Product safety

Please conform to product regulations (such as safety and radiation regulations), and maintain a safe servicing environment by following the safety instructions described in this manual.

① Use specified parts for repair.

Use genuine parts. Be sure to use important parts for safety.

② Do not perform modifications without proper instructions.

Please follow the specified safety methods when modification(addition/change of parts) is required due to interferences such as radio/TV interference and foreign noise.

③ Make sure the soldering of repaired locations is properly performed.

When you solder while repairing, please be sure that there are no cold solder and other debris.
Soldering should be finished with the proper quantity. (Refer to the example)

④ Make sure the screws are tightly fastened.

Please be sure that all screws are fastened, and that there are no loose screws.

⑤ Make sure each connectors are correctly inserted.

Please be sure that all connectors are inserted, and that there are no imperfect insertion.

⑥ Make sure the wiring cables are set to their original state.

Please replace the wiring and cables to the original state after repairs.
In addition, be sure that there are no pinched wires, etc.

⑦ Make sure screws and soldering scraps do not remain inside the product.

Please check that neither solder debris nor screws remain inside the product.

⑧ There should be no semi-broken wires, scratches, melting, etc. on the coating of the power cord.

Damaged power cords may lead to fire accidents, so please be sure that there are no damages.
If you find a damaged power cord, please exchange it with a suitable one.

⑨ There should be no spark traces or similar marks on the power plug.

When spark traces or similar marks are found on the power supply plug, please check the connection and advise on secure connections and suitable usage. Please exchange the power cord if necessary.

⑩ Safe environment should be secured during servicing.

When you perform repairs, please pay attention to static electricity, furniture, household articles, etc. in order to prevent injuries.
Please pay attention to your surroundings and repair safely.

2. Adjustments

To keep the original performance of the products, optimum adjustments and confirmation of characteristics within specification.
Adjustments should be performed in accordance with the procedures/instructions described in this manual.

3. Lubricants, Glues, and Replacement parts

Use grease and adhesives that are equal to the specified substance.
Make sure the proper amount is applied.

4. Cleaning

For parts that require cleaning, such as optical pickups, tape deck heads, lenses and mirrors used in projection monitors, proper cleaning should be performed to restore their performances.

5. Shipping mode and Shipping screws

To protect products from damages or failures during transit, the shipping mode should be set or the shipping screws should be installed before shipment. Please be sure to follow this method especially if it is specified in this manual.

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1. SPECIFICATIONS

General

Power requirements . . . . . 220 V to 240 V, 50 Hz / 60 Hz
Power consumption
DVR-645H-S . . . .43 W
DVR-545H-S . . . . . 40 W
Power consumption in standby mode . . . . . 0.61 W
(Front panel display: off)
Weight
DVR-645H-S. . . . . 4.5 kg
DVR-545H-S . . . . . .4.4 kg
Dimensions . . . . 420 mm (W) x 69 mm (H) x 318 mm (D)
Operating temperature . . . . . .+5 °C to +35 °C
Operating humidity . . . . . .5 % to 85 %
(no condensation)
TV system . . . . . PAL/SECAM/
NTSC (external input only)

Readable discs
DVD-Video, DVD-RW, DVD-R, DVD+R, DVD+RW, DVD-RAM, Video CD, Super VCD, CD, CD-R/-RW (WMA, MP3, JPEG, CD-DA)

Recording discs and formats
DVD-R/RW: VR mode and Video mode
DVD+R/+RW: +VR mode
DVD-RAM: VR mode
DVD-R DL: VR mode and Video mode
DVD+R DL: +VR mode

Video recording format
Sampling frequency . . . . . 13.5 MHz
Compression format. . . . . MPEG
Audio recording format
Sampling frequency . . . . . .48 kHz
Compression format . . . . . Dolby Digital or Linear PCM
(uncompressed)
Recording time
HDD
DVR-645H-S (250 GB)
Fine (XP) . . . . . Approx. 53 h
Standard Play (SP) . . . . . .Approx. 106 h
Long Play (LP) . . . . . Approx. 212 h
Extended Play (EP) . . . . . Approx. 319 h
Super Long Play (SLP) . . . . . Approx. 425 h
Super Extended Play (SEP) . . . . . .Approx. 532 h
Manual Mode (MN). . . . . Approx. 53 h to 711 h

DVR-545H-S (160 GB)
Fine (XP) . . . . . Approx. 34 h
Standard Play (SP) . . . . . .Approx. 68 h
Long Play (LP) . . . . . Approx. 136 h
Extended Play (EP) . . . . . Approx. 204 h
Super Long Play (SLP) . . . . . Approx. 272 h
Super Extended Play (SEP) . . . . . .Approx. 340 h
Manual Mode (MN). . . . . Approx. 34 h to 455 h

DVD-R/-RW, DVD+R/+RW, DVD-RAM
Fine (XP) . . . . . Approx. 1 h
Standard Play (SP) . . . . . Approx. 2 h
Long Play (LP) . . . . . .Approx. 4 h
Extended Play (EP) . . . . . .Approx. 6 h
Super Long Play (SLP) . . . . . Approx. 8 h
Super Extended Play (SEP) . . . . . .Approx. 10 h
(DVD-R/-RW, DVD-RAM only)
Manual Mode (MN)
DVD-R/-RW/-RAM . . . . . Approx. 1 h to 13 h
DVD+R/+RW . . . . . Approx. 1 h to 8 h

DVD-R DL/DVD+R DL
Fine (XP) . . . . . .Approx. 1 h 51 m
Standard Play (SP) . . . . . .Approx. 3 h 35 m
Long Play (LP) . . . . . Approx. 7 h 11 m
Extended Play (EP) . . . . . Approx. 10 h 46 m
Super Long Play (SLP) . . . . . .Approx. 14 h 21 m
Super Extended Play (SEP) . . . . . Approx. 17 h 57 m
(DVD-R DL only)
Manual Mode (MN)
DVD-R DL . . . . . Approx. 1 h 51 m to 24 h
DVD+R DL . . . . . Approx. 1 h 51 m to 14 h 21 m

Timer

Programs . . . . . .1 month/32 programs
Clock . . . . . Quartz lock (24-hour digital display)

Tuner

Receivable channels

	SECAM B/G PAL B/G		PAL I	
	Frequency	Channel	Frequency	Channel
VHF (low)	47 MHz to 89 MHz	E2 to E4 X to Z	44 MHz to 89 MHz	A to C X to Z
VHF (high)	104 MHz to 300 MHz	E5 to E12 S1 to S20 M1 to M10 U1 to U10	104 MHz to 300 MHz	D to J 11, 13 S1 to S20
Hyper	302 MHz to 470 MHz	S21 to S41	302 MHz to 470 MHz	S21 to S41
UHF	470 MHz to 862 MHz	E21 to E69	470 MHz to 862 MHz	E21 to E69

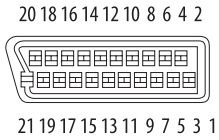
	SECAM L		SECAM D/K PAL D/K	
	Frequency	Channel	Frequency	Channel
VHF (low)	49 MHz to 65 MHz	FB, FC1, FC	49 MHz to 94 MHz	R1 to R5
VHF (high)	104 MHz to 300 MHz	F1 to F6 B to Q	104 MHz to 300 MHz	R6 to R12 S1 to S20
Hyper	300 MHz to 470 MHz	S21 to S41	302 MHz to 470 MHz	S21 to S41
UHF	470 MHz to 862 MHz	21 to 69	470 MHz to 862 MHz	E21 to E69

STEREO
B/G - A2
I - NICAM
L - NICAM
B/G - NICAM
D/K - NICAM

Input/Output

VHF/UHF antenna input/output terminal
. . . . . .VHF/UHF set 75Ω (IEC connector)
Video input
. . . . . AV2 (Input 1), Input 2 (front), Input 3 (rear)
Input level . . . . . 1 Vp-p (75Ω)
Jacks
. . . . . AV connector (Input 1), RCA jack (Input 2, Input 3)
Video output . . . . . AV1, Output
Output level . . . . . 1 Vp-p (75Ω)
Jacks . . . . . AV connector (AV1)
RCA jack (Output)
S-Video input
. . . . . AV2 (Input 1), Input 2 (front), Input 3 (rear)
Y (luminance) - Input level . . . . . 1 Vp-p (75Ω)
C (colour) - Input level . . . . . 300 mVp-p (75Ω)
Jacks . . . . . AV connector 2 (Input 1),
4 pin mini DIN (Input 2)
S-Video output . . . . . AV1, Output
Y (luminance) - Output level . . . . . 1 Vp-p (75Ω)
C (colour) - Output level . . . . . 300 mVp-p (75Ω)
Jacks . . . . . AV connector 1 (AV1),
4 pin mini DIN (Output)
Component video output
Output level . . . . . Y: 1.0 Vp-p (75Ω)
P_B, P_R: 0.7 Vp-p (75Ω)
Jacks . . . . . RCA jacks
RGB input . . . . . .AV 2 (Input 1)
Input level . . . . . 0.7 Vp-p (75Ω)
Jacks . . . . . AV connector (Input 1)
RGB output . . . . . .AV 1
Output level . . . . . 0.7 Vp-p (75Ω)
Jacks . . . . . AV connector (AV1)
Audio input
. . . . . AV2 (Input 1), Input 2 (front), Input 3 (rear) L/R
Input level
During audio input . . . . . 2 V rms
(Input impedance: more than 22 kΩ)
Jacks . . . . . .AV connector 2 (Input 1),
RCA jacks (Input 2)
Audio output . . . . . AV1, Output
During audio output . . . . . 2 V rms
(Output impedance: less than 1.5 kΩ)
Jacks . . . . . AV connector 1 (AV1),
RCA jacks (Output)
Control input . . . . . .Mini jack
Digital audio ouptut . . . . . Coaxial
G-LINK™ . . . . . Mini jack
DV input (DVR-645H-S only). . . . . .4 pin (front)
(i.LINK/IEEE 1394 standard)
USB (DVR-645H-S only) . . .Type A (front), Type B (front)
HDMI . . . . . .19 pin

AV Connectors (21-pin connector assignment)
AV connector input/output . . . . . 21-pin connector
This connector provides the video and audio signals for connection to a compatible colour TV or monitor.



PIN no.	AV1(RGB)-TV / AV2(INPUT 1)
1	Audio 2/R out / Audio 2/R out
2	- / Audio 2/R in
11	G out / G in
3	Audio 1/L out / Audio 1/L out
6	- / Audio 1/L in
15	R or C out / R or C in
4	GND
17	GND
7	B out / B in
19	Video out or Y out / Video out
20	- / Video in or Y in
8	Status
21	GND

Supplied accessories

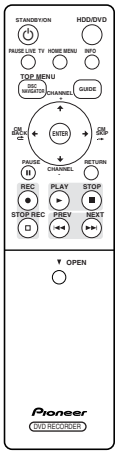
Remote control 1
Dry cell batteries (AA/R6P) 2
Audio / Video cable (red/white/yellow) 1
G-LINK™ cable 1
RF antenna cable 1
Power cable 1
Operating Instructions
Warranty card 1

Note: The specifications and design of this product are subject to change without notice, due to improvement.

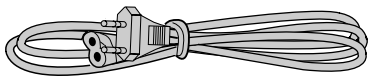
This product includes FontAvenue® fonts licenced by NEC corporation. FontAvenue is a registered trademark of NEC Corporation.

● Accessories

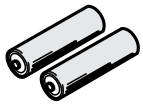
• Remote control ×1
(VXX3129)



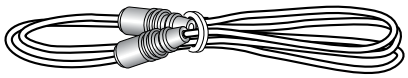
• Power cable ×1
(ADG1127)



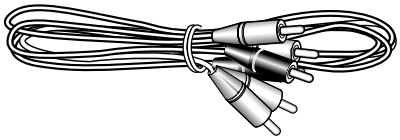
• Dry cell batteries ×2
(AA/R6P)



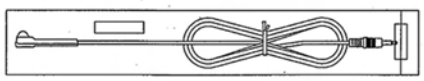
• RF antenna cable(PAL) ×1
(VDE1075)



• Audio / Video cable(1.5m) ×1
(red/white/yellow)
(VDE1077)



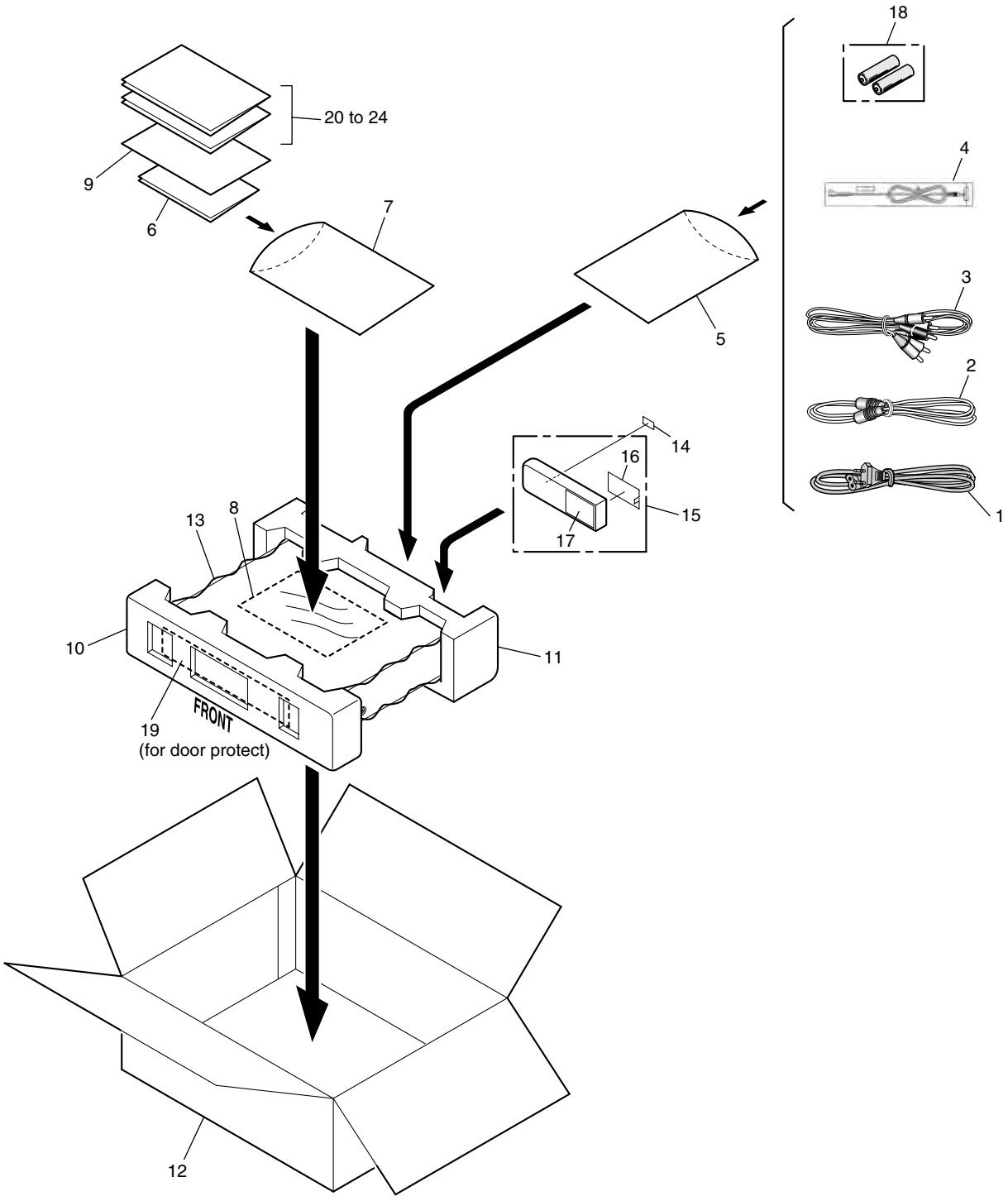
• G-Link Cable (3m) ×1
(VDX1010)



2. EXPLODED VIEWS AND PARTS LIST

NOTES:
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Screws adjacent to ▼ mark on product are used for disassembly.*
- *For the applying amount of lubricants or glue, follow the instructions in this manual. (In the case of no amount instructions, apply as you think it appropriate.)*

2.1 PACKING



(1) PACKING SECTION PARTS LIST

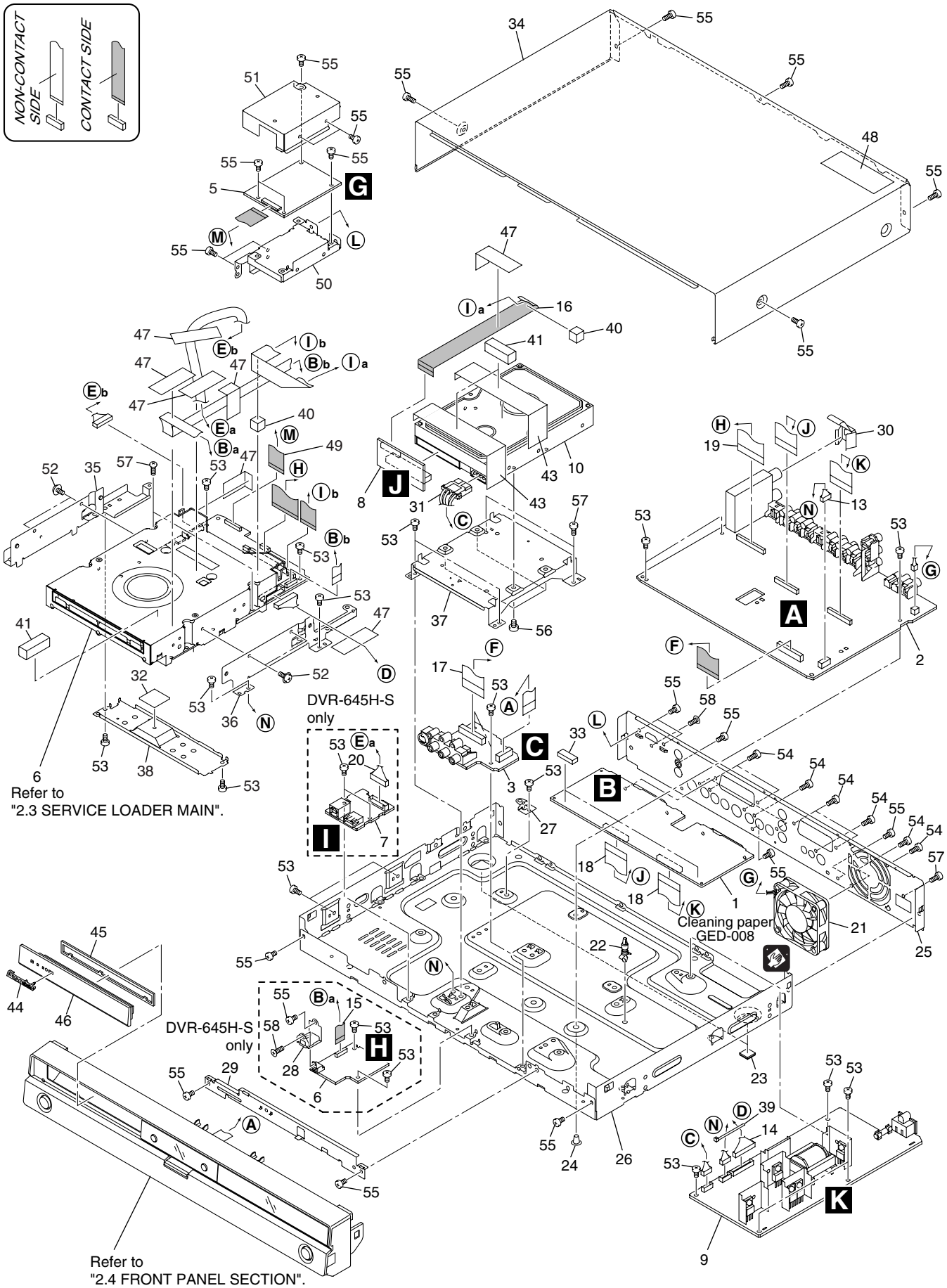
Mark	No.	Description	Part No.
⚠	1	Power Cord	ADG1127
	2	RF Antenna Cable (PAL)	VDE1075
	3	Audio/Video Cable (1.5m)	VDE1077
	4	G-Link Cable (3m)	VDX1010
	5	Polyethylene Bag B5	VHL1088
NSP	6	Warranty Card	ARY7065
	7	Polyethylene Bag	See Contrast table (2)
NSP	8	HDD Caution 8L B	See Contrast table (2)
NSP	9	HDD Caution 8L	See Contrast table (2)
	10	Front Pad	See Contrast table (2)
	11	Rear Pad	See Contrast table (2)
	12	Packing Case	See Contrast table (2)
	13	Mirror Sheet	See Contrast table (2)
	14	WEEE Label	VRW2231
	15	Remote Control Unit	VXX3129
	16	Battery Cover	VZN1004
	17	Top Cover	VZN1009
NSP	18	Dry Cell Battery (R6P, AA)	VEM1010
	19	Mirror Sheet	VHL1104
	20	Operating Instructions (French)	VRC1366
	21	Operating Instructions (German)	VRC1367
	22	Operating Instructions (Italian)	VRC1368
	23	Operating Instructions (Dutch)	VRC1369
	24	Operating Instructions (Spanish)	VRC1370

(2) CONTRAST TABLE

DVR-645H-S/WYXV5, WYXK5, DVR-545H-S/WYXV5 and WYXK5 are constructed the same except for the following:

Mark	No.	Symbol and Description	DVR-645H-S /WYXV5	DVR-645H-S /WYXK5	DVR-545H-S /WYXV5	DVR-545H-S /WYXK5
	7	Polyethylene Bag	VHL1088	VHL1051	VHL1088	VHL1051
NSP	8	HDD Caution 8L B	VRR1062	VRR1046	VRR1062	VRR1046
NSP	9	HDD Caution 8L	VRR1063	VRR1047	VRR1063	VRR1047
	10	Front Pad	VHA1415	VHA1404	VHA1415	VHA1404
	11	Rear Pad	VHA1416	VHA1405	VHA1416	VHA1405
	12	Packing Case	VHG2763	VHG2771	VHG2762	VHG2770
	13	Mirror Sheet	VHL1095	VHL1107	VHL1095	VHL1107

2.2 EXTERIOR SECTION



(1) EXTERIOR SECTION PARTS LIST

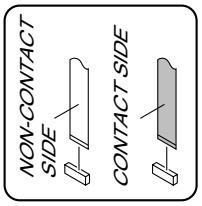
Mark	No.	Description	Part No.
	1	SCRB Assy	VWV2269
	2	TUJB Assy (for service)	See Contrast table (2)
	3	FJKB Assy (for service)	VXX3113
	4	MAIN Assy (for service)	See Contrast table (2)
	5	HDMIB Assy	VWV2247
	6	DVJB Assy	See Contrast table (2)
	7	USBB Assy	See Contrast table (2)
	8	ATAB Assy (for service)	VXX3140
⚠	9	POWER SUPPLY Unit	VWR1399
	10	HDD	See Contrast table (2)
	11	LOADER Assy (for service)	VXX3156
NSP	12	Service LOADER MAIN	See Contrast table (2)
	13	Connector Assy	PF05PP-S07
	14	Connector Assy	PF13PP-S22
	15	Flexible Cable 24P	See Contrast table (2)
	16	Flexible Cable 40P	VDA2112
	17	Flexible Cable 23P	VDA2115
	18	Flexible Cable 29P	VDA2117
	19	Flexible Cable 35P	VDA2118
	20	Housing USB (MAIN)	See Contrast table (2)
	21	DC Fan Motor 60	VXM1125
	22	PCB Support	AEC1215
	23	Rubber Foot	VEB1349
NSP	24	PC Support	VEC1749
	25	Rear Panel	See Contrast table (2)
NSP	26	Chassis	VNB1055
NSP	27	PCB Base	VNE2378
	28	DV Angle	See Contrast table (2)
NSP	29	Bridge	VNE2429
	30	Earth Plate TU	VBK1162
	31	Housing Assy 4P	VKP2357
	32	Radiation Sheet (Silicone)	VEB1360
	33	Rubber Spacer	VEB1378
	34	Bonnet	VXX3105
NSP	35	Writer Stay L	VNE2421
NSP	36	Writer Stay R	VNE2422
NSP	37	HDD Stay	VNE2423
	38	Heatsink	VNH1077
NSP	39	Binder (BK-1)	ZCA-BK1
	40	Rubber Spacer B	VEB1380
	41	Gasket 30 x 10T	VEC2522
	42	Aluminum Tape 25 x 25	VEF1060
	43	Aluminum Tape 180 x 25	VEF1065
	44	Pioneer Name Plate	VAM1148
	45	Tray Sheet	VEC2500
	46	Tray Panel	VNK5910
NSP	47	Tape	ZTA-156A-19
	48	Laser Caution Label	VRW2262
	49	Flexible Cable 40P	VDA2157
NSP	50	HDMI Stay	VNE2441
	51	HDMI Shield	VNF1137
	52	Screw	AMZ30P040FTC
	53	Screw	BBZ30P060FTC
	54	Screw	BPZ30P080FTC
	55	Screw	BSZ30P040FTC
	56	#6-32 Screw	DBA1125
	57	Screw	PBZ30P080FTC
	58	Screw M3 x 8	See Contrast table (2)

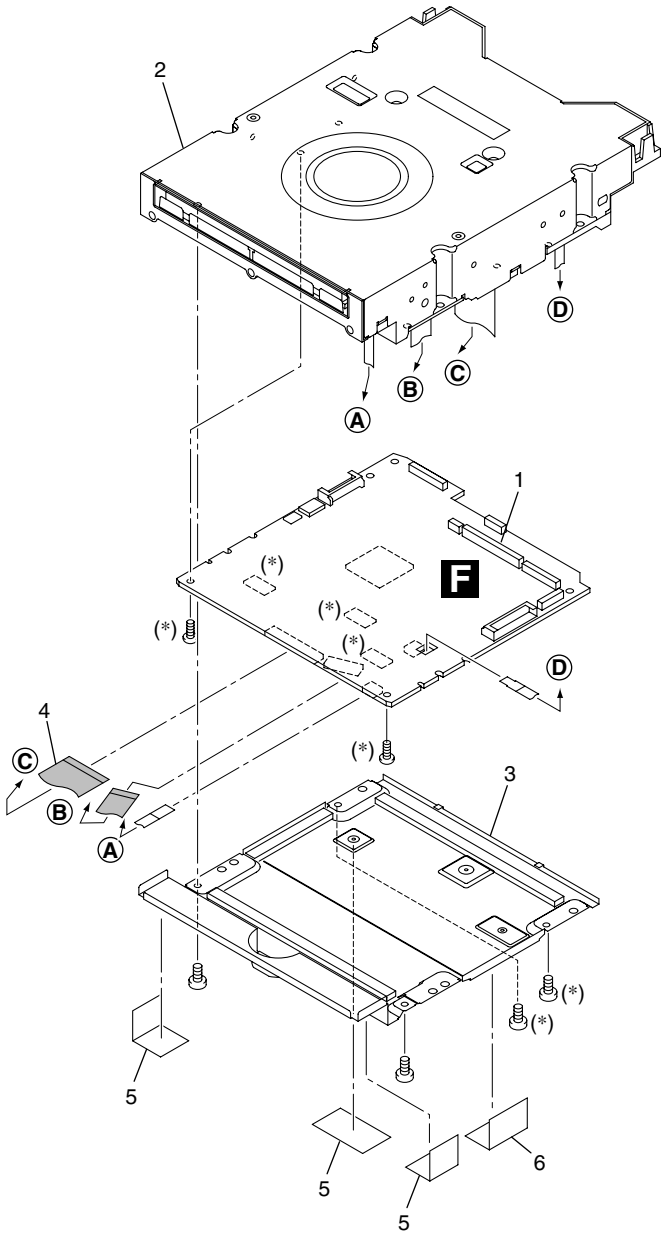
(2) CONTRAST TABLE

DVR-645H-S/WYXV5, WYXK5, DVR-545H-S/WYXV5 and WYXK5 are constructed the same except for the following:

Mark	No.	Symbol and Description	DVR-645H-S /WYXV5	DVR-645H-S /WYXK5	DVR-545H-S /WYXV5	DVR-545H-S /WYXK5
	2	TUJB Assy (for service)	VXX3183	VXX3183	VXX3182	VXX3182
	4	MAIN Assy (for service)	VXX3176	VXX3176	VXX3175	VXX3175
	6	DVJB Assy	VWV2160	VWV2160	Not used	Not used
	7	USBB Assy	VWV2161	VWV2161	Not used	Not used
	10	HDD 250G ST3250823ACE	VXF1082	VXF1082	Not used	Not used
	10	HDD 160G ST3160212ACE	Not used	Not used	VXF1110	VXF1110
NSP	12	Service LOADER MAIN	VXU1006	VXU1006	VXU1005	VXU1005
	15	Flexible Cable 24P	VDA2111	VDA2111	Not used	Not used
	20	Housing USB (MAIN)	VKP2380	VKP2380	Not used	Not used
	25	Rear Panel	VNA2945	VNA2951	VNA2942	VNA2950
	28	DV Angle	VNE2426	VNE2426	Not used	Not used
	58	Screw M3 x 8	VBA1088	VBA1088	Not used	Not used

2.3 SERVICE LOADER MAIN





Reuse (*) marked parts when exachanging Service LOADER Assy.

- Silicon Sheet R9B (DEB1726) x3
- Case Screw S (DBA1250) x2
- Frontboard Screw R7C (DBA1220) x2

SERVICE LOADER MAIN PARTS LIST

Mark	No.	Description	Part No.
	1	MAIN Assy (for service) (645H)	VXX3176
	1	MAIN Assy (for service) (545H)	VXX3175
	2	LOADER Assy (for service)	VXX3156
	3	Low Case U11	DNC1761
	4	FFC U11	DDX1208
NSP	5	Tape	ZTA-156A-19
	6	Aluminum Tape 25x25	VEF1060

A

B

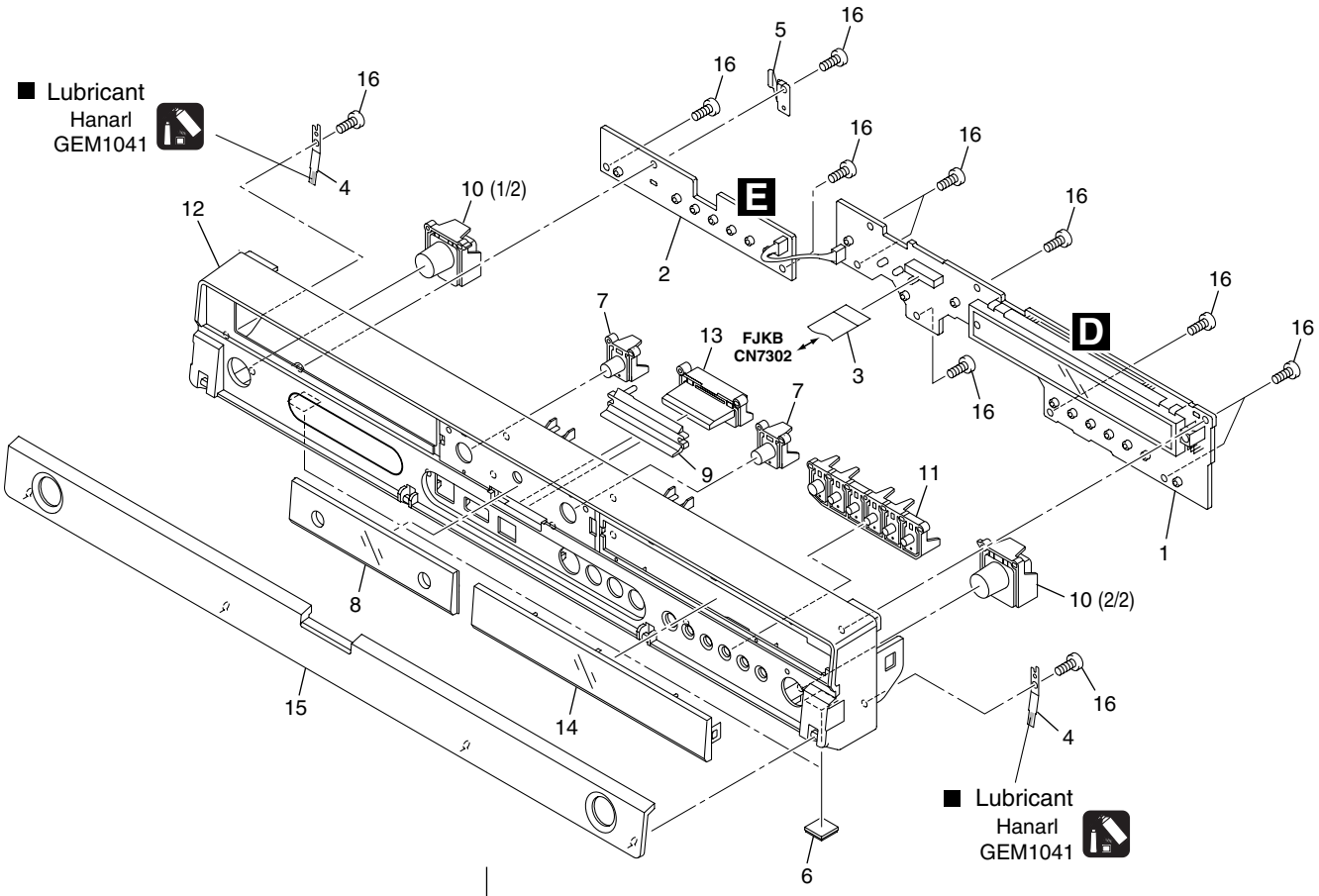
C

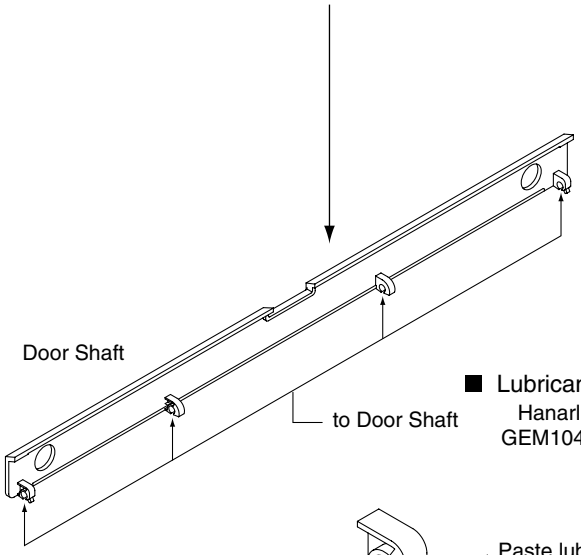
D

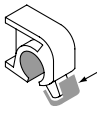
E

F

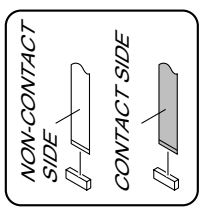
2.4 FRONT PANEL SECTION







Paste lubricant hanarl (GEM1041) to salient points of both side of the door.



(1) FRONT PANEL SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	FLKY Assy (for service)	VXX3180
	2	KEYB Assy (for service)	VXX3112
	3	Flexible Cable 12P	VDA2116
	4	Door Spring	VBK1159
	5	Earth Plate	VBK1166
	6	Rubber Foot	VEB1349
	7	Sub Key	VNK5909
	8	Center Lens	VNK6119
	9	LED Lens	VNK5913
	10	Main Key	See Contrast table (2)
	11	Function Key	VNK5936
	12	Front Panel	See Contrast table (2)
	13	Center Key	See Contrast table (2)
	14	FL Lens PTD	See Contrast table (2)
	15	Door PTD	See Contrast table (2)
	16	Screw	BPZ30P080FTC

(2) CONTRAST TABLE

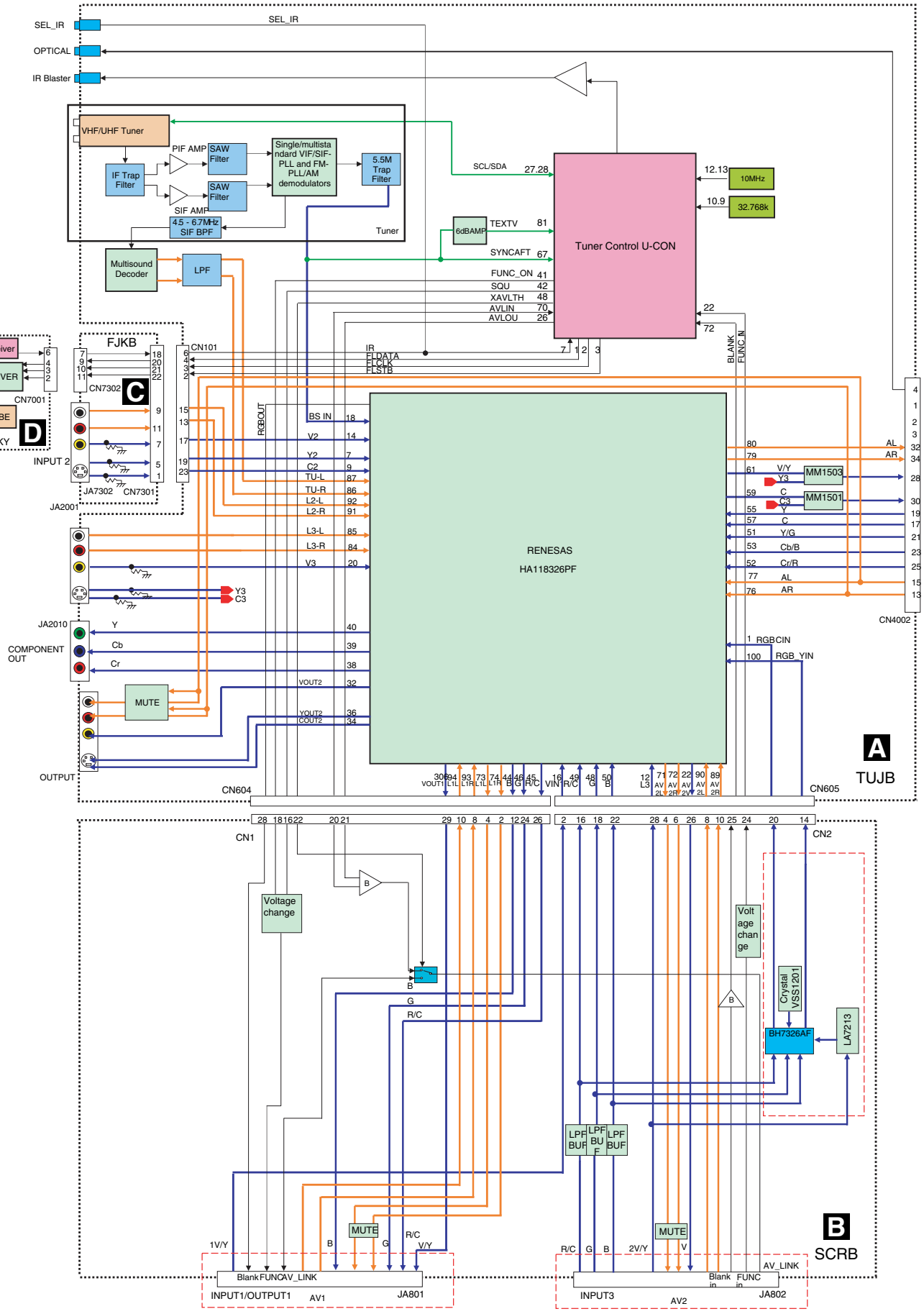
DVR-645H-S/WYXV5, WYXK5, DVR-545H-S/WYXV5 and WYXK5 are constructed the same except for the following:

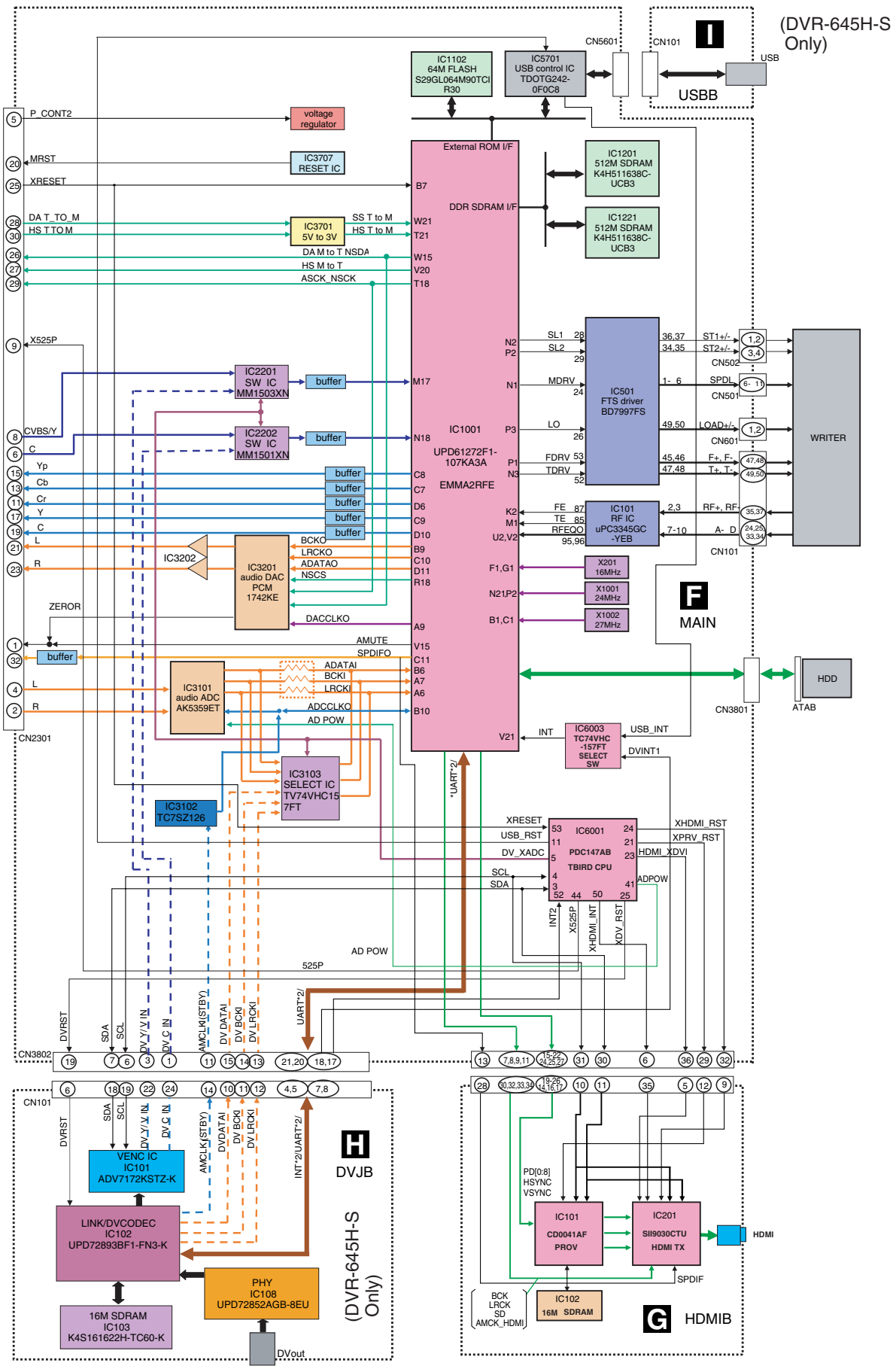
Mark	No.	Symbol and Description	DVR-645H-S /WYXV5	DVR-645H-S /WYXK5	DVR-545H-S /WYXV5	DVR-545H-S /WYXK5
	10	Main Key	VNK5925	VNK5925	VNK5908	VNK5908
	12	Front Panel	VNK5957	VNK5957	VNK5923	VNK5923
	13	Center Key	VNK6026	VNK6026	VNK6025	VNK6025
	14	FL Lens PTD	VXA2826	VXA2826	VXA2825	VXA2825
	15	Door PTD	VXA2823	VXA2823	VXA2822	VXA2822

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

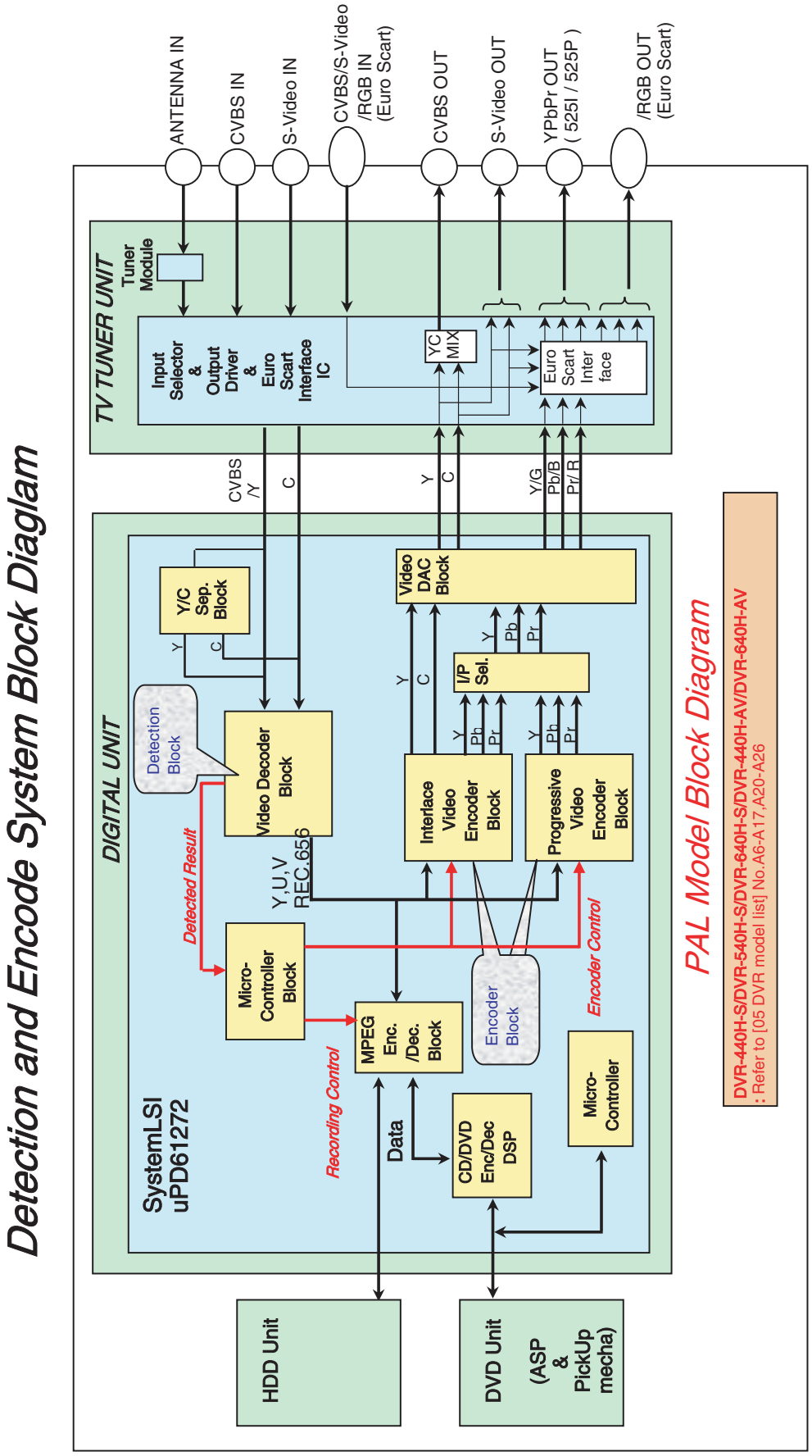
3.1 BLOCK DIAGRAM

3.1.1 OVERALL BLOCK DIAGRAM

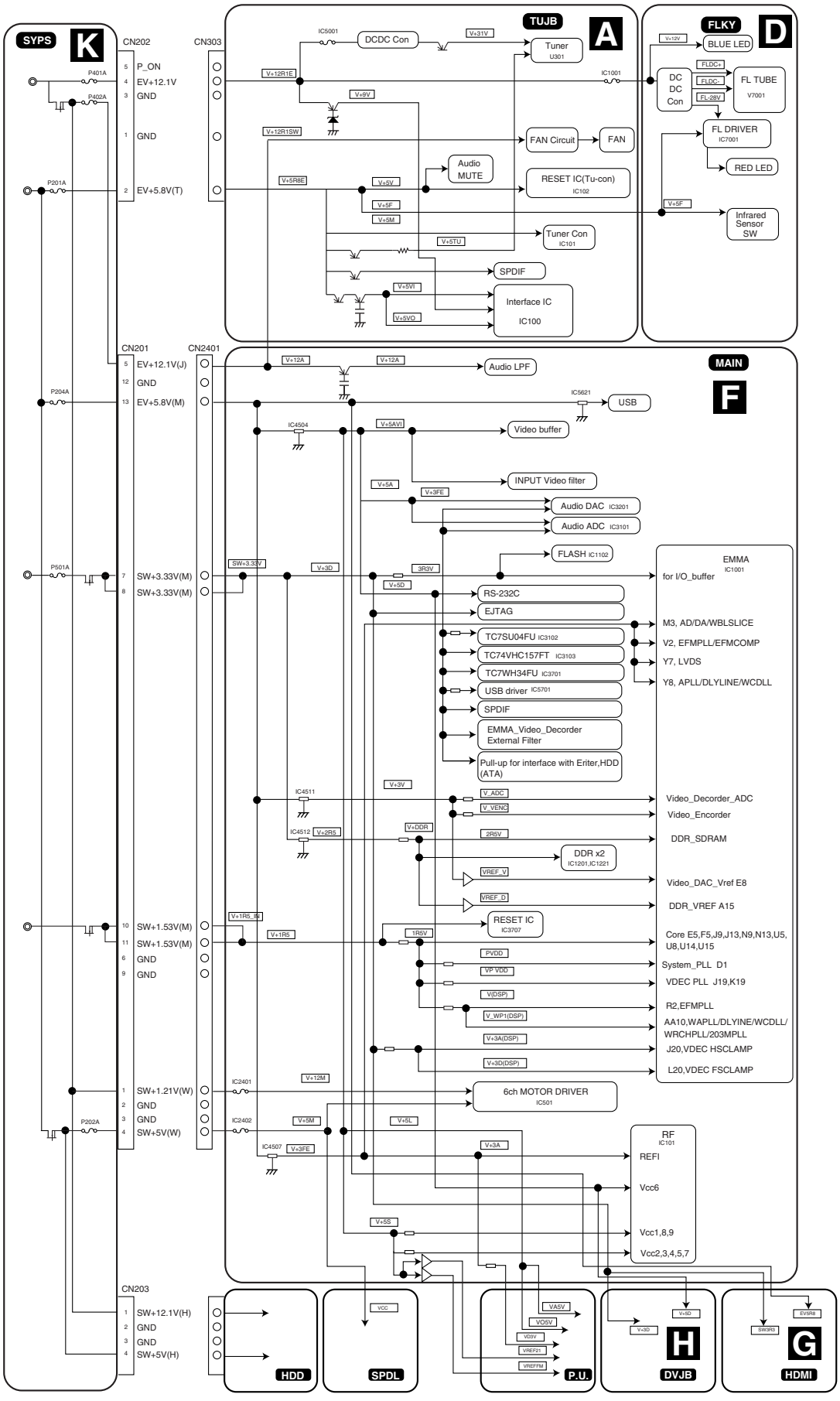



(DVR-645H-S Only)
I
USBB
USB
CN5601
CN101
IC1102 64M FLASH S29GL064M90TCI R30
IC5701 USB control IC TDOTG242-0F0C8
P_CONT2
voltage regulator
MRST
IC3707 RESET IC
XRESET
DA T_TO_M
HS T TO M
IC3701 5V to 3V
SS T to M
HS T to M
DA M to T NSDA
HS M to T
ASCK_NSCK
External ROM I/F
DDR SDRAM I/F
IC1201 512M SDRAM K4H511638C-UCB3
IC1221 512M SDRAM K4H511638C-UCB3
IC1001
UPD61272F1-107KA3A
EMMA2RFE
X525P
CVBS/Y
C
Yp
Cb
Cr
Y
C
L
R
buffer
IC2201 SW IC MM1503XN
IC2202 SW IC MM1501XN
IC3202
IC3201 audio DAC PCM 1742KE
BCKO
LRCKO
ADATAO
NSCS
DACCLKO
ZEROR
AMUTE
SPDIFO
IC3101 audio ADC AK5359ET
ADATAI
BCKI
LRCKI
ADCCLKO
AD POW
CN2301
IC3102 TC7SZ126
IC3103 SELECT IC TV74VHC157FT
IC501 FTS driver BD7997FS
SL1
SL2
MDRV
LO
FDRV
TDRV
IC101 RF IC uPC3345GC-YEB
FE
TE
RFEQO
X201 16MHz
X1001 24MHz
X1002 27MHz
CN502
CN501
CN601
CN101
WRITER
F
MAIN
CN3801
HDD
ATAB
IC6003 TC74VHC-157FT SELECT SW
INT
USB_INT
DVINT1
UART*2/
XRESET
USB_RST
DV_XADC
SCL
SDA
IC6001 PDC147AB TBIRD CPU
XHDMI_RST
XPRV_RST
HDMI_XDVI
ADPOW
INT2
X525P
XHDMI_INT
XDV_RST
AD POW
525P
CN3802
DVRST
SDA
SCL
DV_Y/V IN
DV_C IN
AMCLK(STBY)
DV DATAI
DV BCKI
DV LRCKI
H
DVJB
CN101
VENC IC IC101 ADV7172KSTZ-K
LINK/DVCODEC IC102 UPD72893BF1-FN3-K
16M SDRAM IC103 K4S161622H-TC60-K
PHY IC108 UPD72852AGB-8EU
DVout
INT*2/UART*2/
(DVR-645H-S Only)
PD[0:8]
HSYNC
VSYNC
IC101 CD0041AF PROV
IC201 SII9030CTU HDMI TX
HDMI
SPDIF
BCK
LRCK
SD
AMCK_HDMI
IC102 16M SDRAM
G
HDMIB

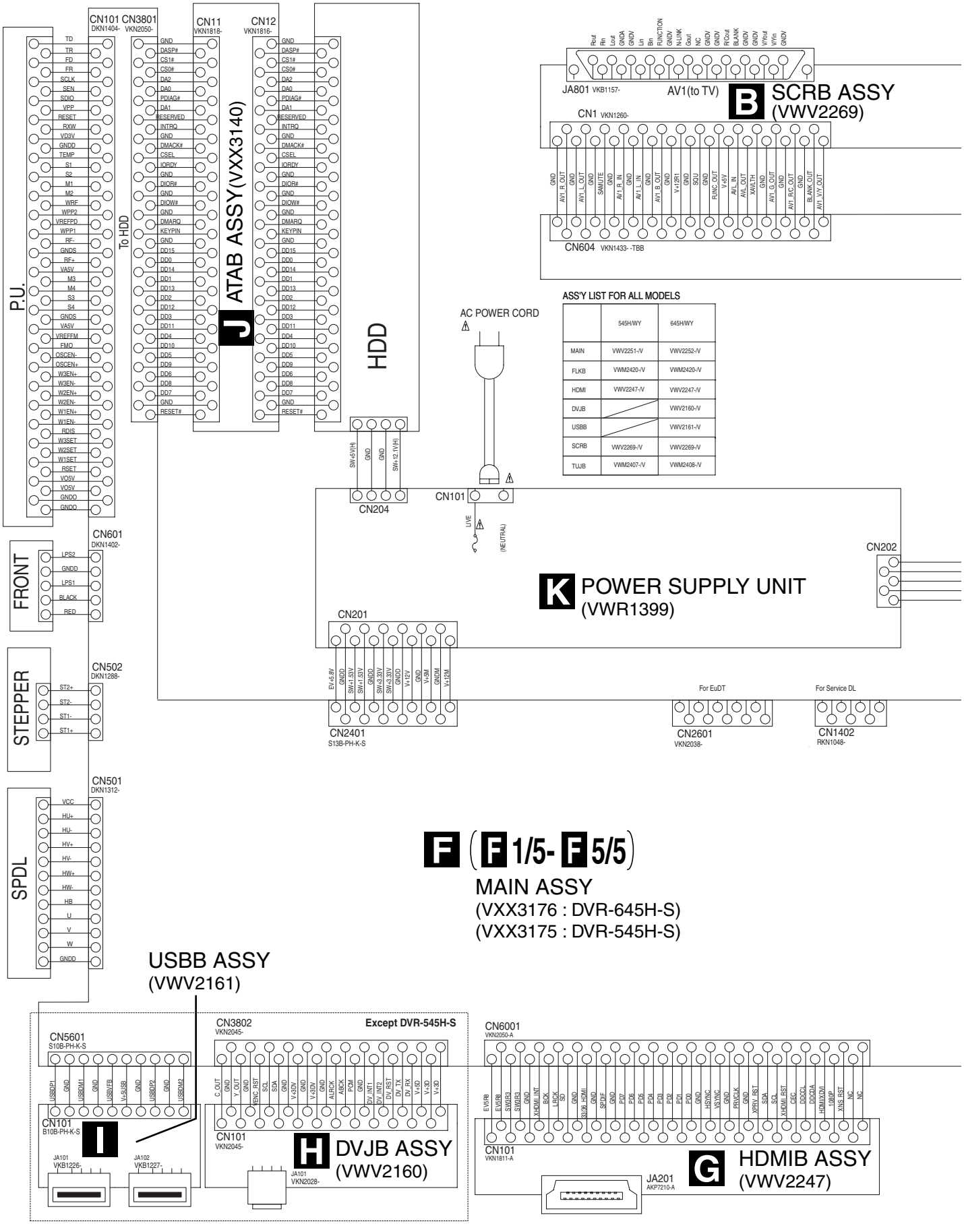
3.1.2 DETECTION AND ENCODE SYSTEM BLOCK DIAGRAM

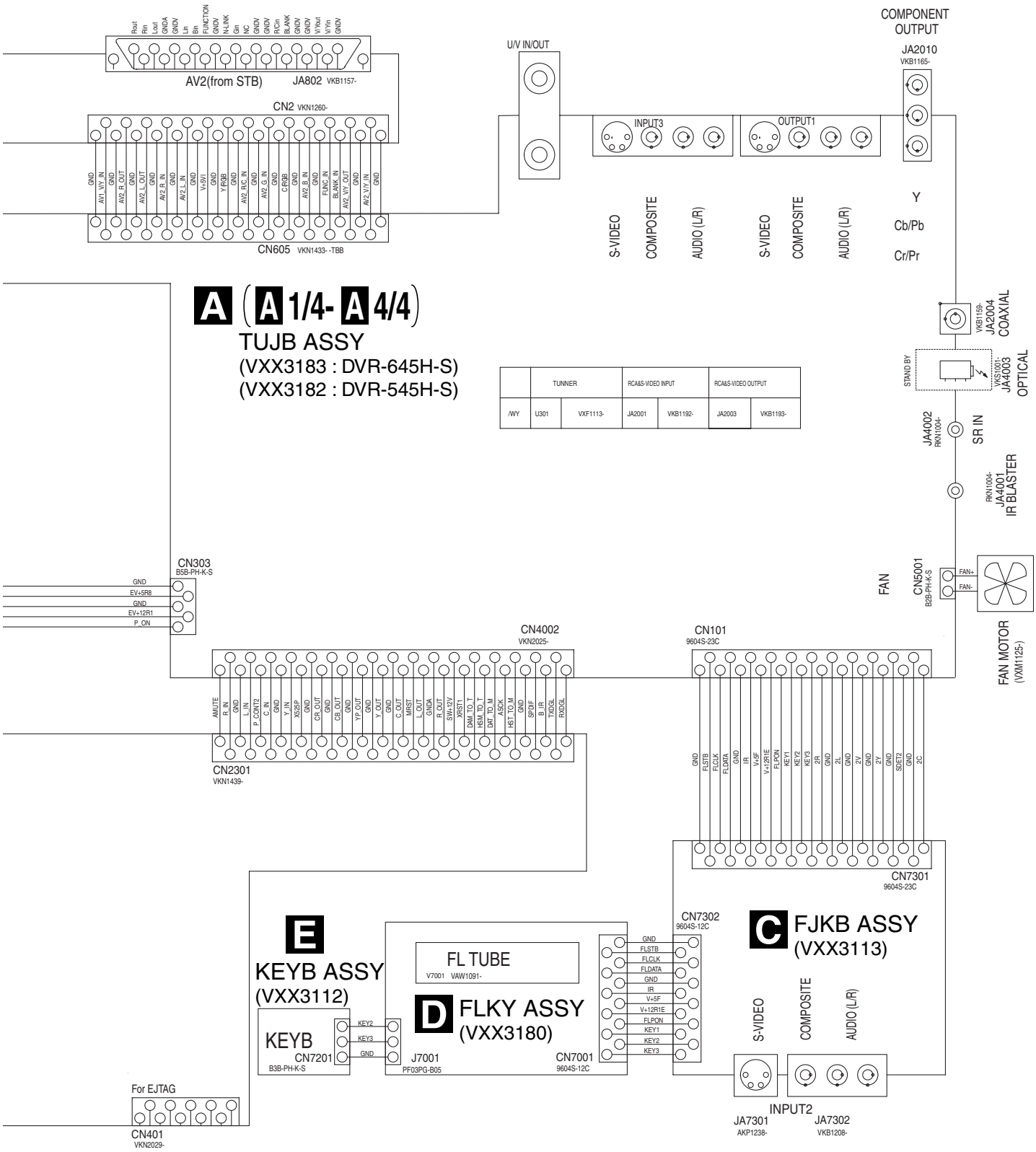


3.1.3 POWER BLOCK



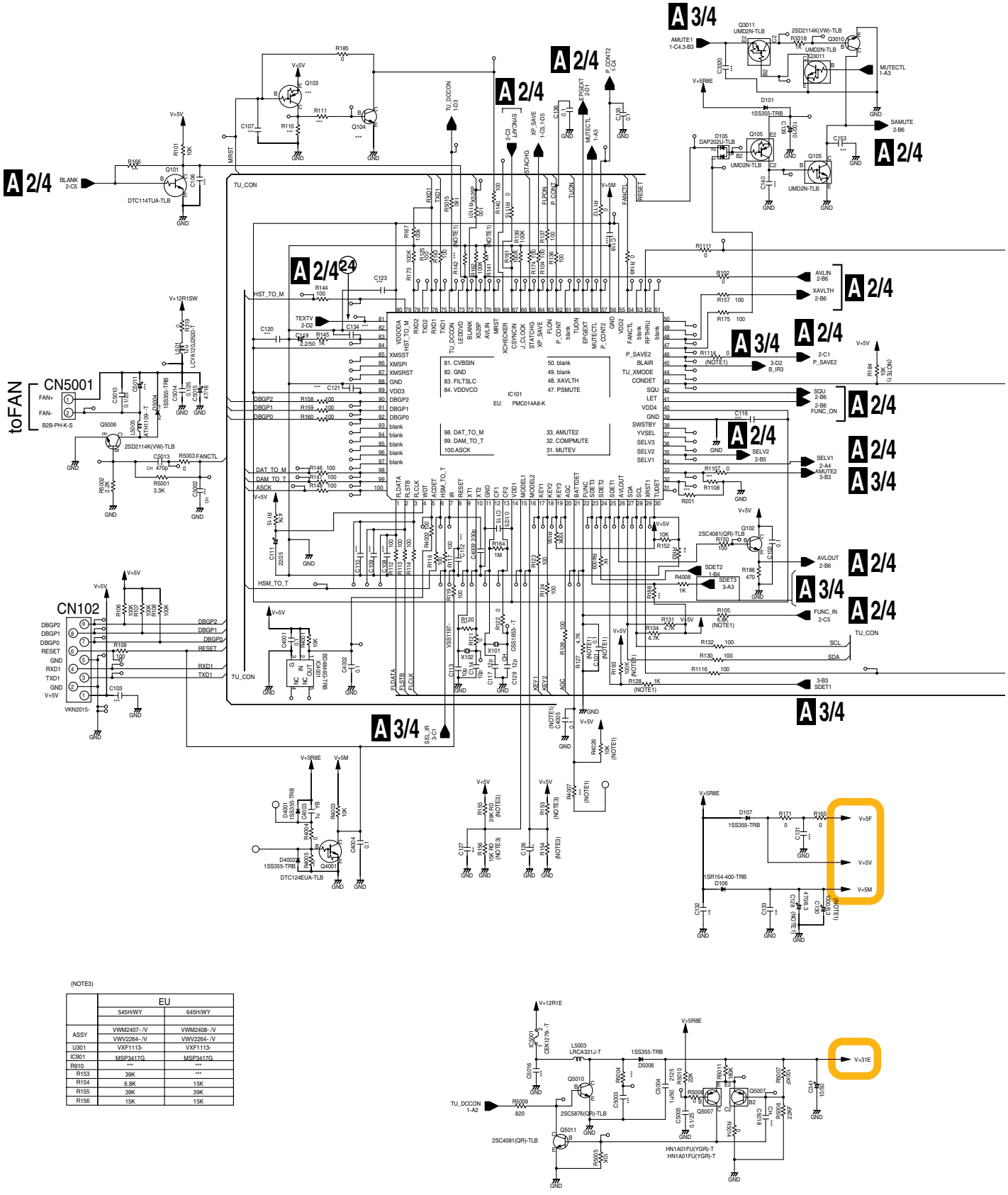
3.2 OVERALL WIRING DIAGRAM





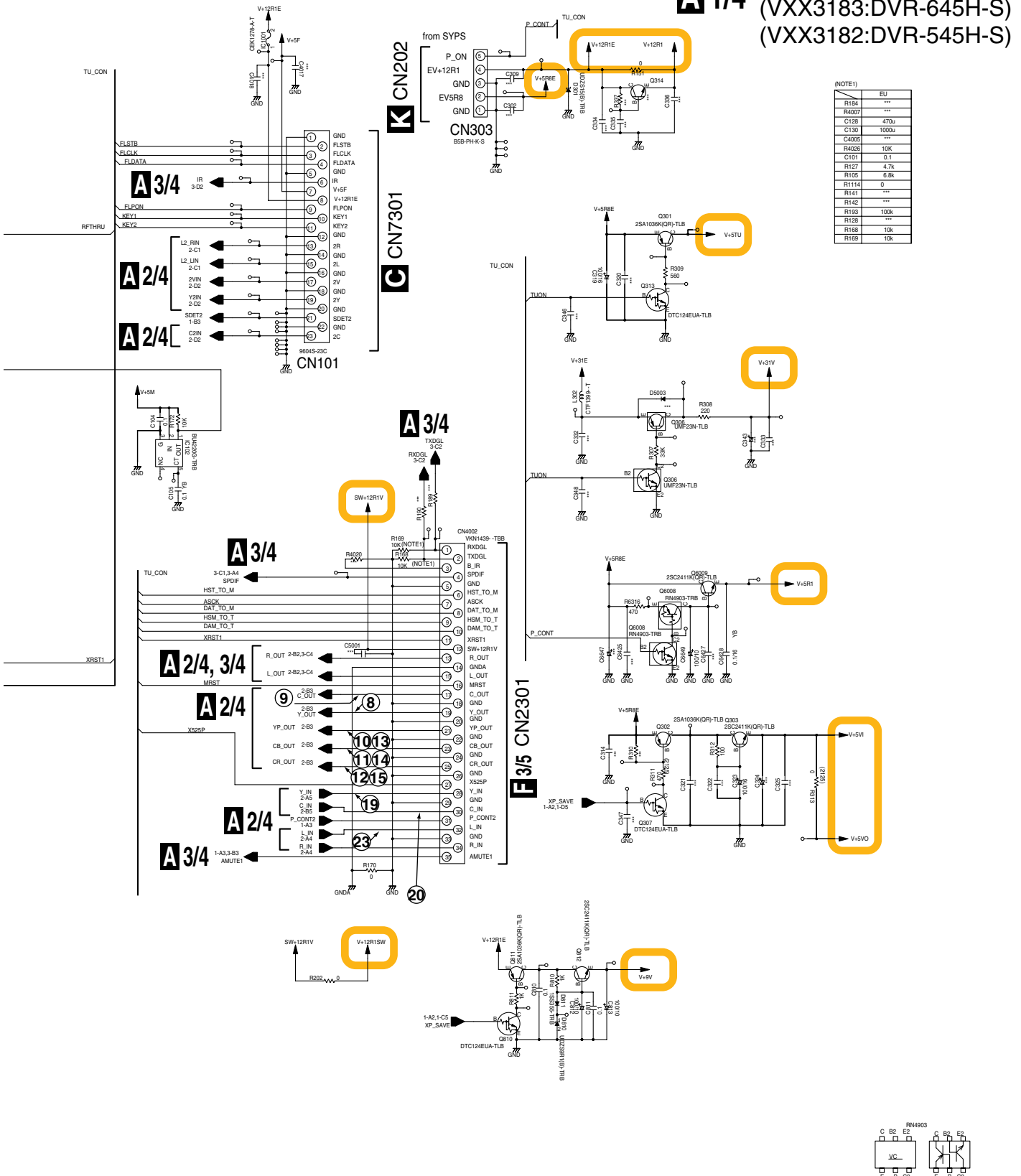
- When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- : The power supply is shown with the marked box.

3.3 TUJB ASSY (1/4)



(NOTE3)

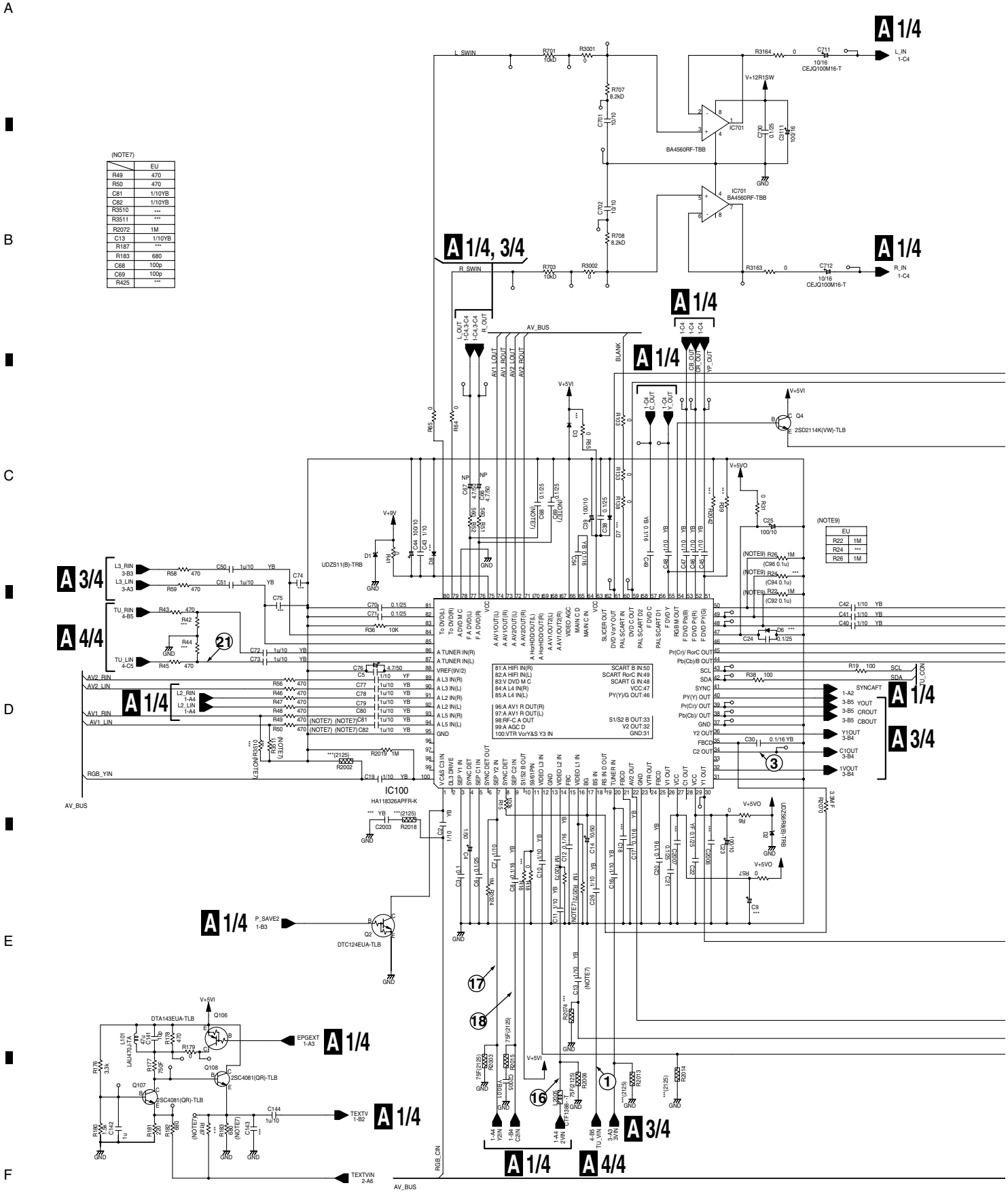
	EU	
	545H/WY	645H/WY
ASSY	VWM2407- /V	VWM2408- /V
	VWV2264- /V	VWV2264- /V
U301	VXF1113-	VXF1113-
IC901	MSP3417G	MSP3417G
R910	***	***
R153	39K	***
R154	6.8K	15K
R155	39K	39K
R156	15K	15K



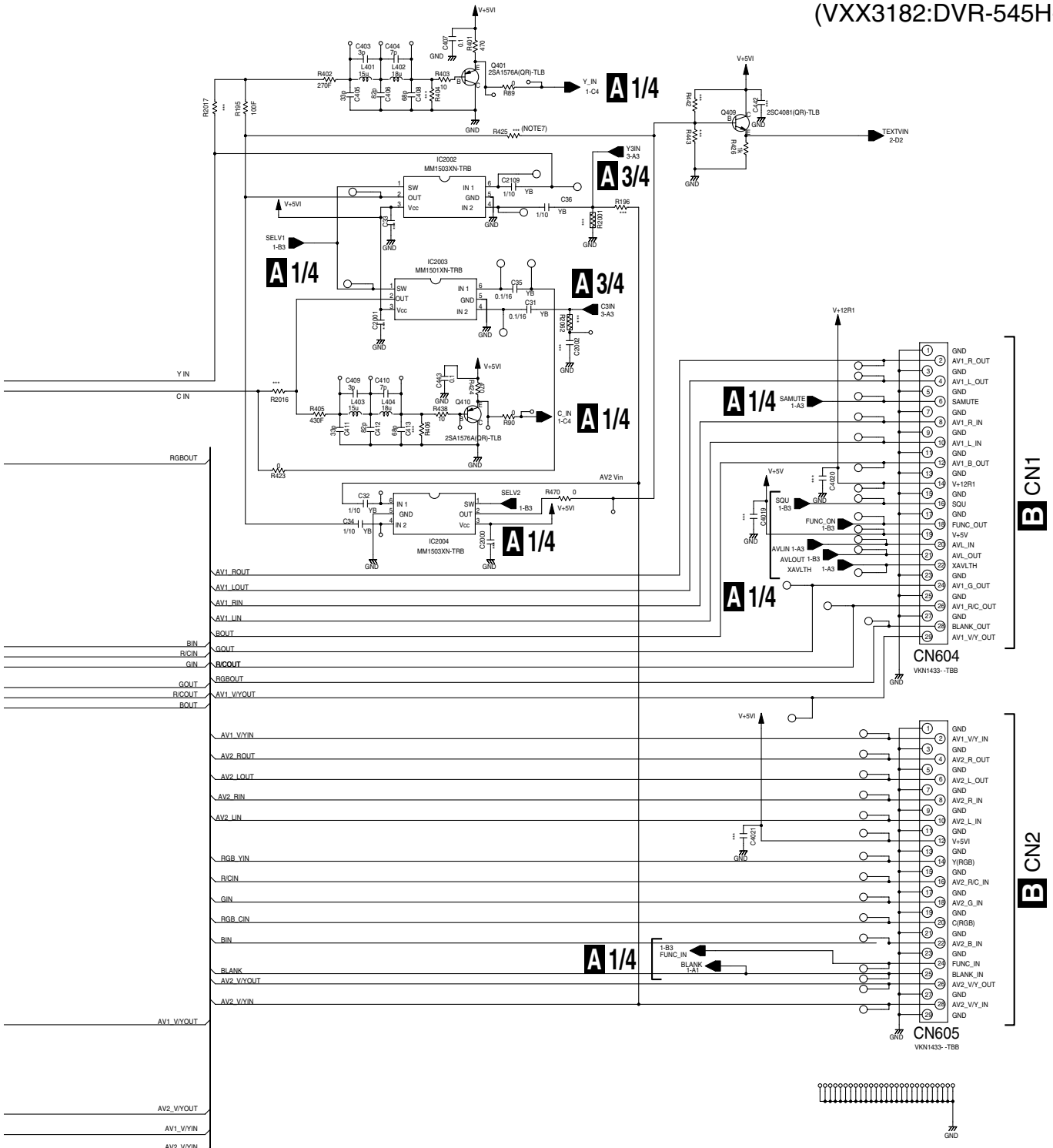
(NOTE1)

	EU
R184	***
R4007	***
C128	470u
C130	1000u
C4005	***
R4026	10K
C101	0.1
R127	4.7k
R105	6.8k
R1114	0
R141	***
R142	***
R193	100k
R128	***
R168	10k
R169	10k

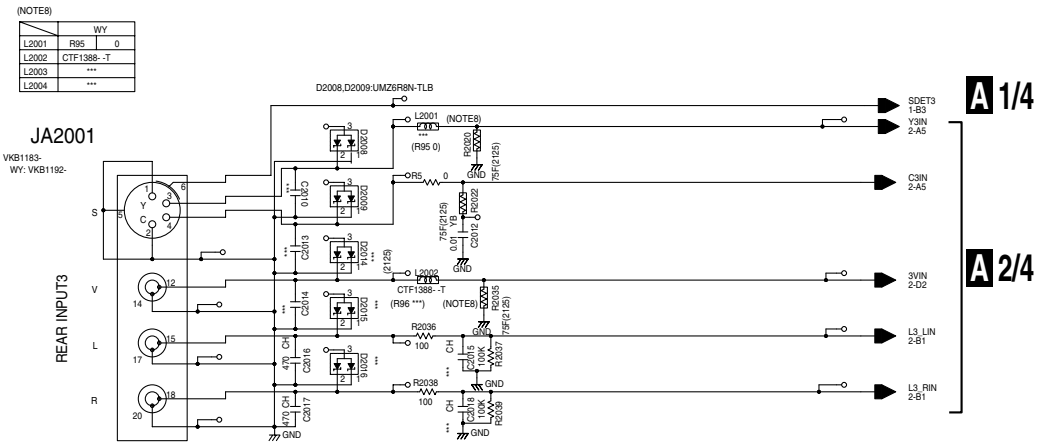
3.4 TUJB ASSY (2/4)

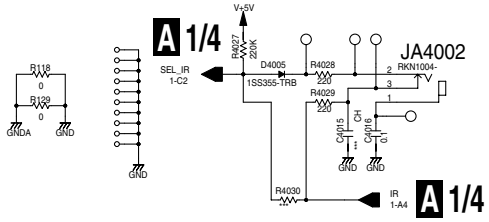


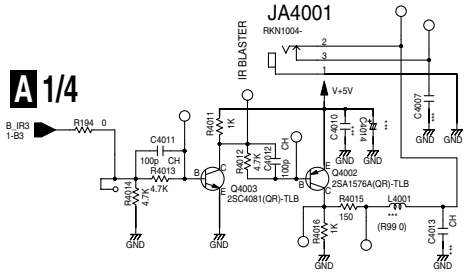
TUJB ASSY (2/4)
(VXX3183:DVR-645H-S)
(VXX3182:DVR-545H-S)



3.5 TUJB ASSY(3/4)

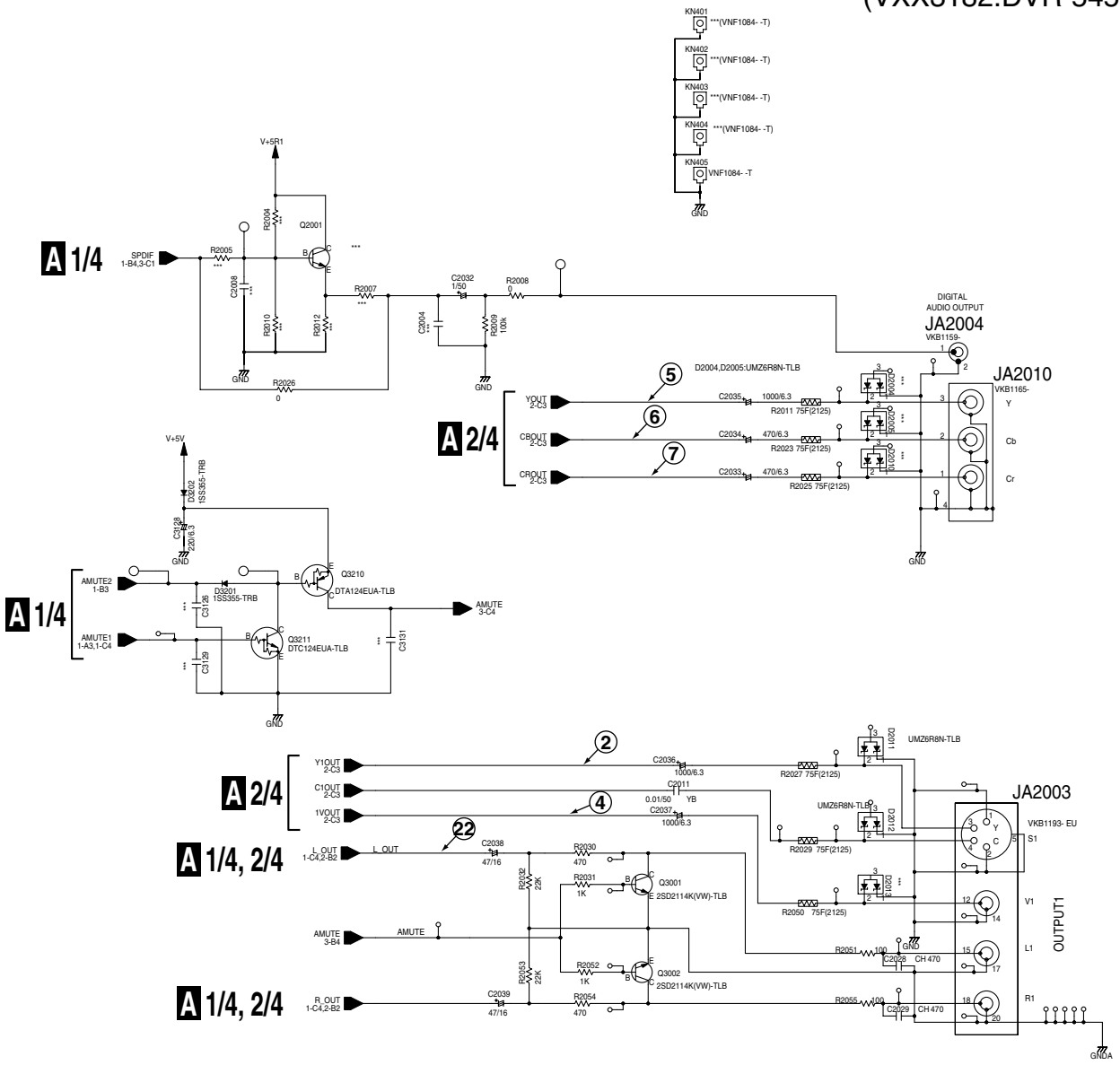




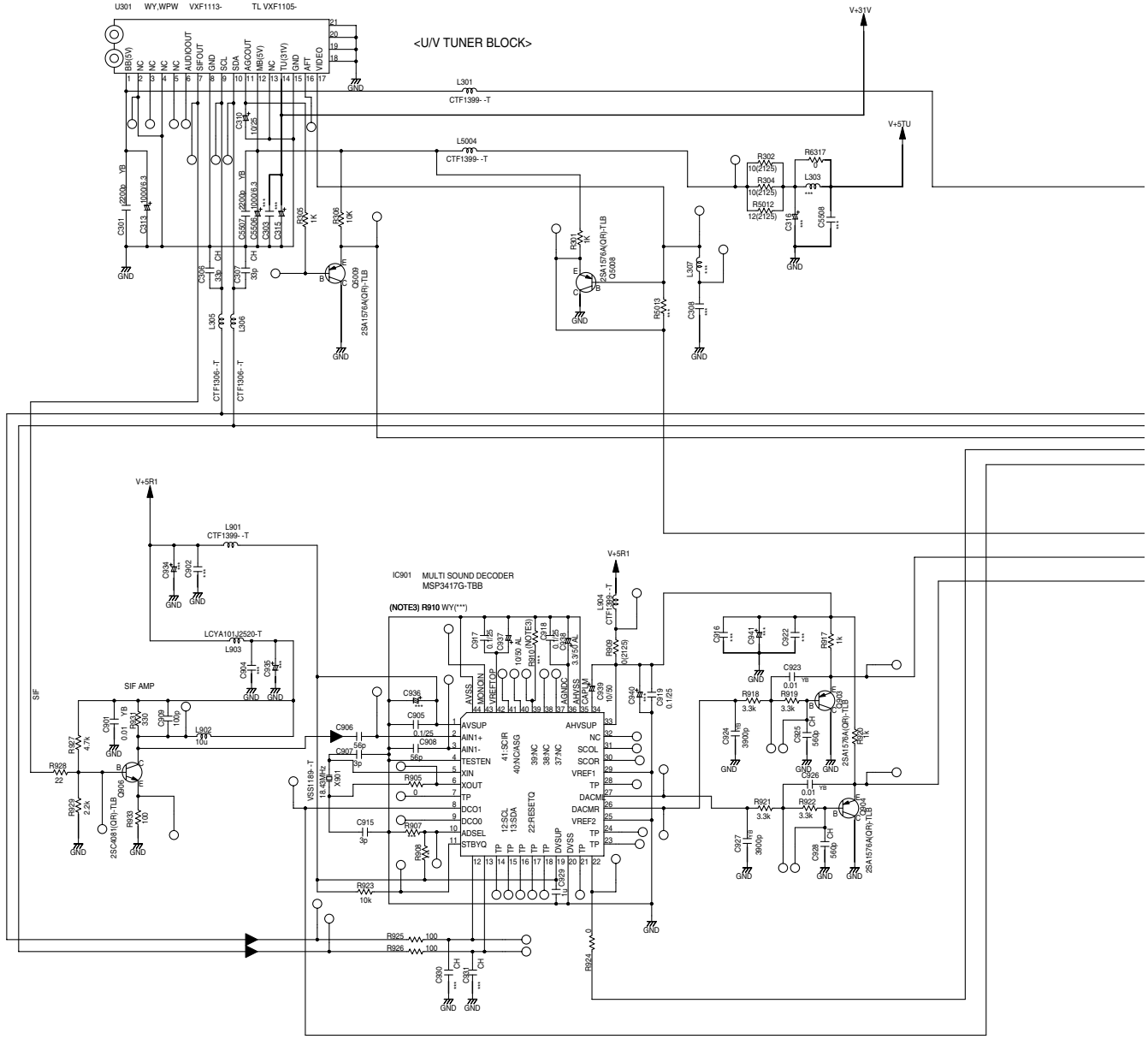


A 3/4

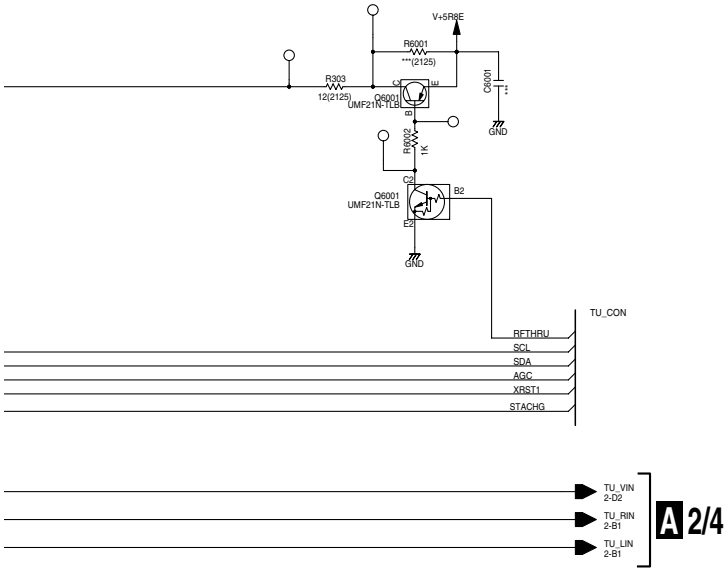
A 3/4 TUJB ASSY (3/4)
(VXX3183:DVR-645H-S)
(VXX3182:DVR-545H-S)



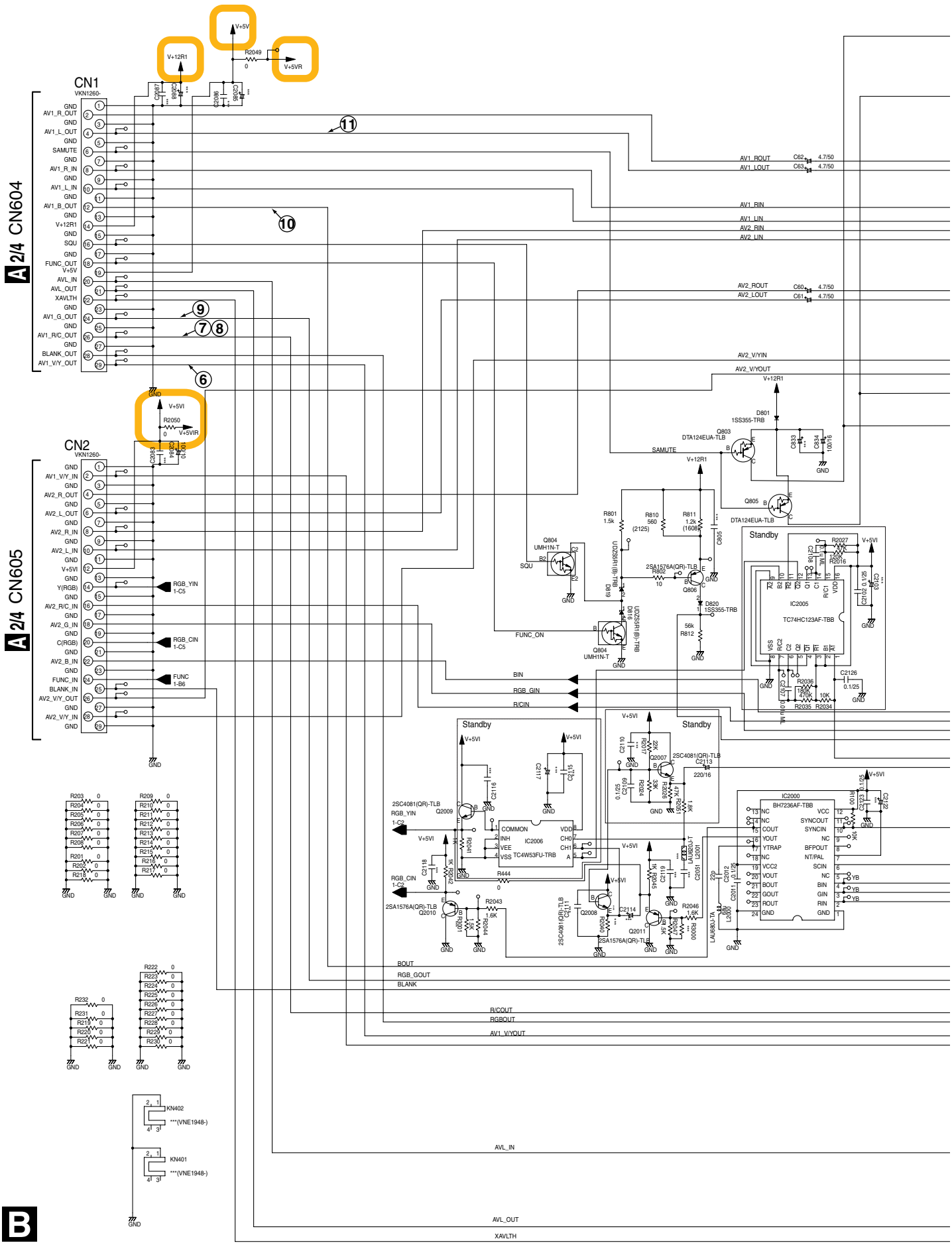
3.6 TUJB ASSY(4/4)



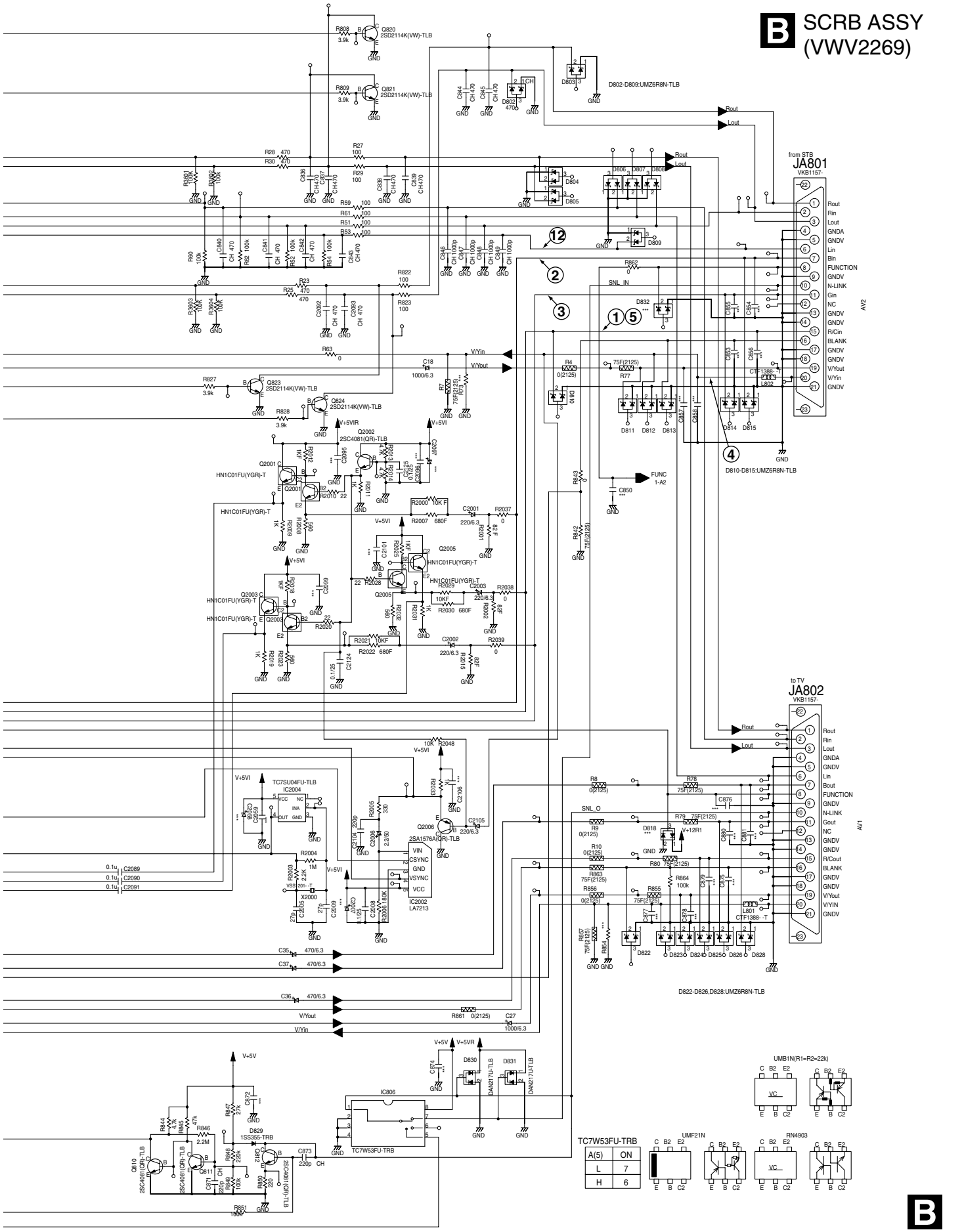
A 4/4 TUJB ASSY (4/4)
(VXX3183:DVR-645H-S)
(VXX3182:DVR-545H-S)



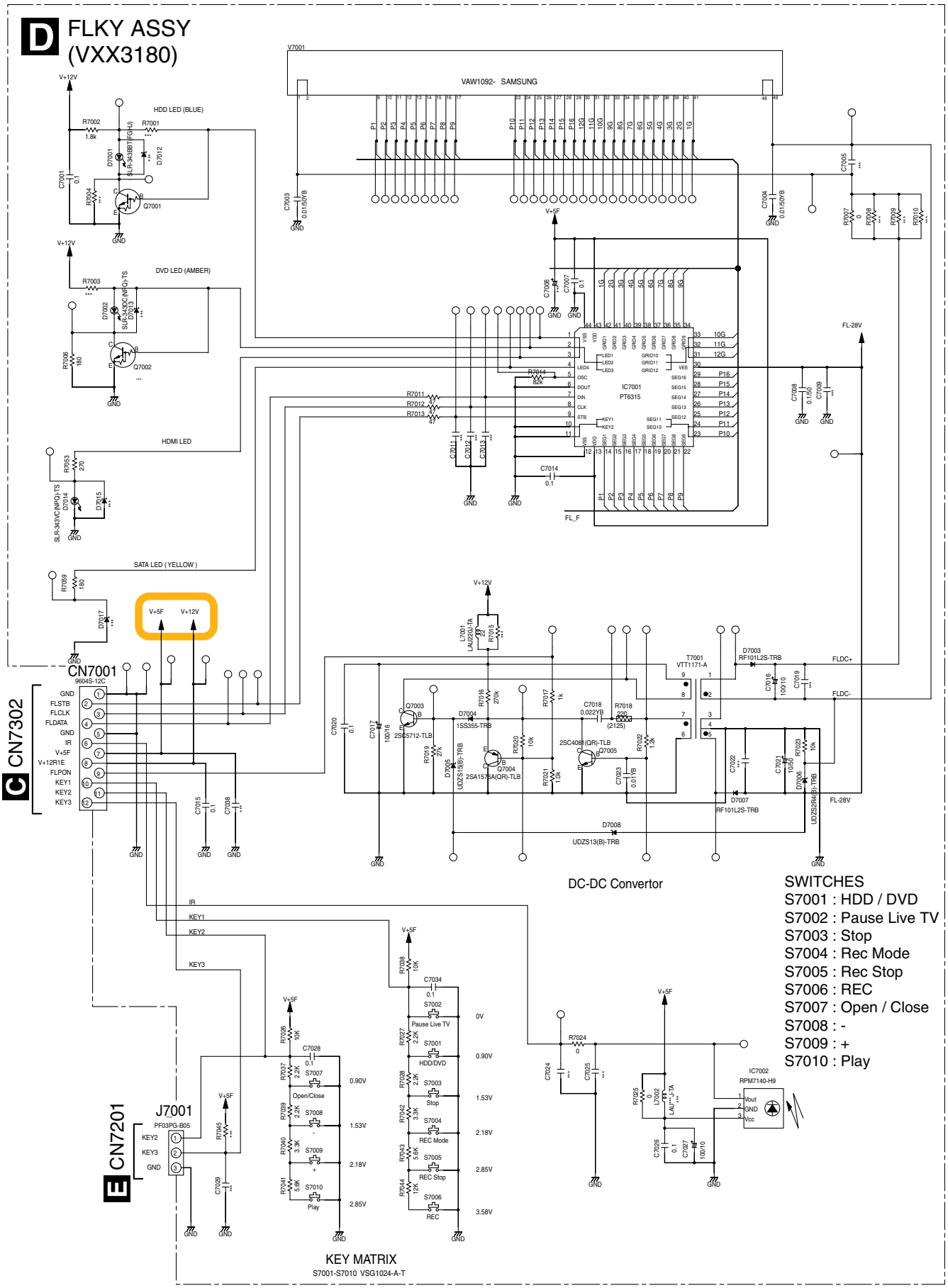
3.7 SCRB ASSY

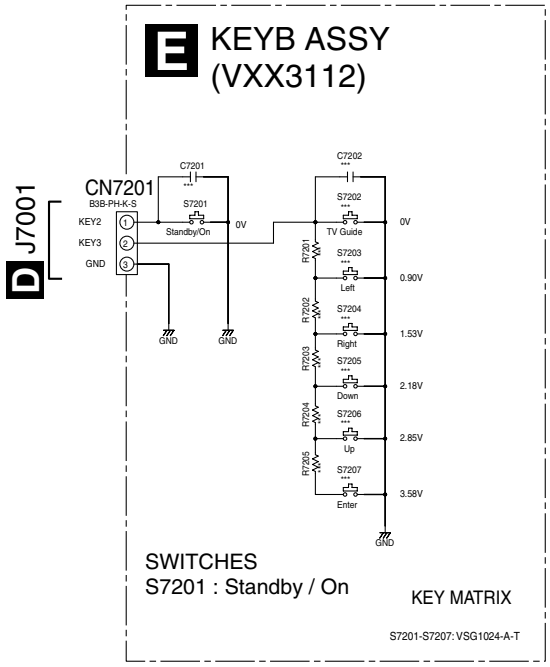

CN1
VKN1260-
GND
AV1_R_OUT
AV1_L_OUT
SAMUTE
AV1_R_IN
AV1_L_IN
AV1_B_OUT
V+12R1
SQU
FUNC_OUT
V+5V
AVL_IN
AVL_OUT
XAVLTH
AV1_G_OUT
AV1_R/C_OUT
BLANK_OUT
AV1_V/Y_OUT
A 2/4 CN604
CN2
VKN1260-
AV1_V/Y_IN
AV2_R_OUT
AV2_L_OUT
AV2_R_IN
AV2_L_IN
V+5VI
Y(RGB)
AV2_R/C_IN
AV2_G_IN
C(RGB)
AV2_B_IN
FUNC_IN
BLANK_IN
AV2_V/Y_OUT
AV2_V/Y_IN
A 2/4 CN605
V+5V
V+12R1
R2049
V+5VR
V+5VI
R2050
V+5VIR
RGB_YIN
1-C5
RGB_CIN
1-C5
FUNC
1-B6
AV1_ROUT
AV1_LOUT
AV1_RIN
AV1_LIN
AV2_RIN
AV2_LIN
AV2_ROUT
AV2_LOUT
AV2_V/YIN
AV2_V/YOUT
SAMUTE
FUNC_ON
SQU
Standby
IC2005
TC74HC123AF-TBB
IC2000
BH7236AF-TBB
IC2006
TC4W53FU-TRB
2SC4081(QR)-TLB
2SA1576A(QR)-TLB
DTA124EUA-TLB
UDZS5R1(B)-TRB
1SS355-TRB
UMH1N-T
LAU680J-TA
BIN
RGB_GIN
R/CIN
BOUT
RGB_GOUT
BLANK
R/COUT
RGBOUT
AV1_V/YOUT
AVL_IN
AVL_OUT
XAVLTH
KN402
***(VNE1948-)
KN401
***(VNE1948-)
GND

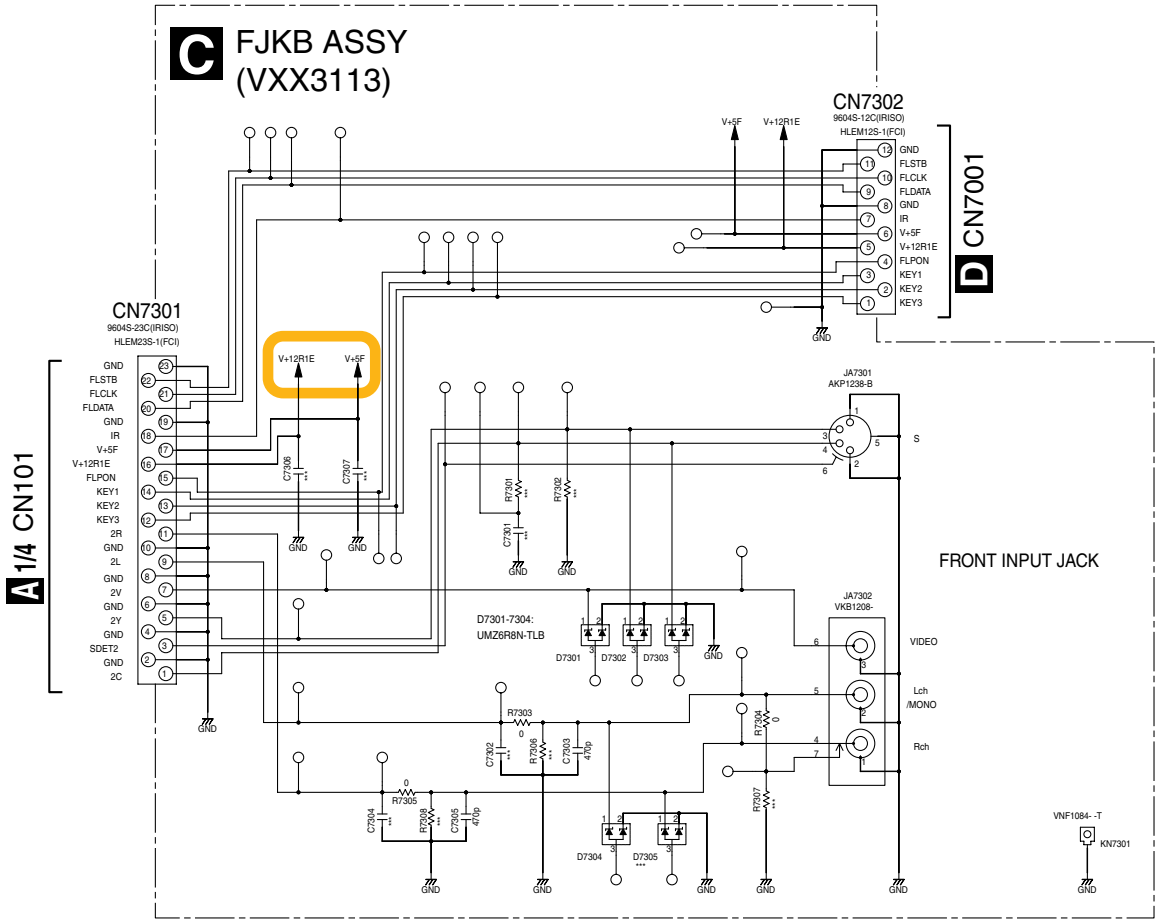
B SCRB ASSY (VWV2269)



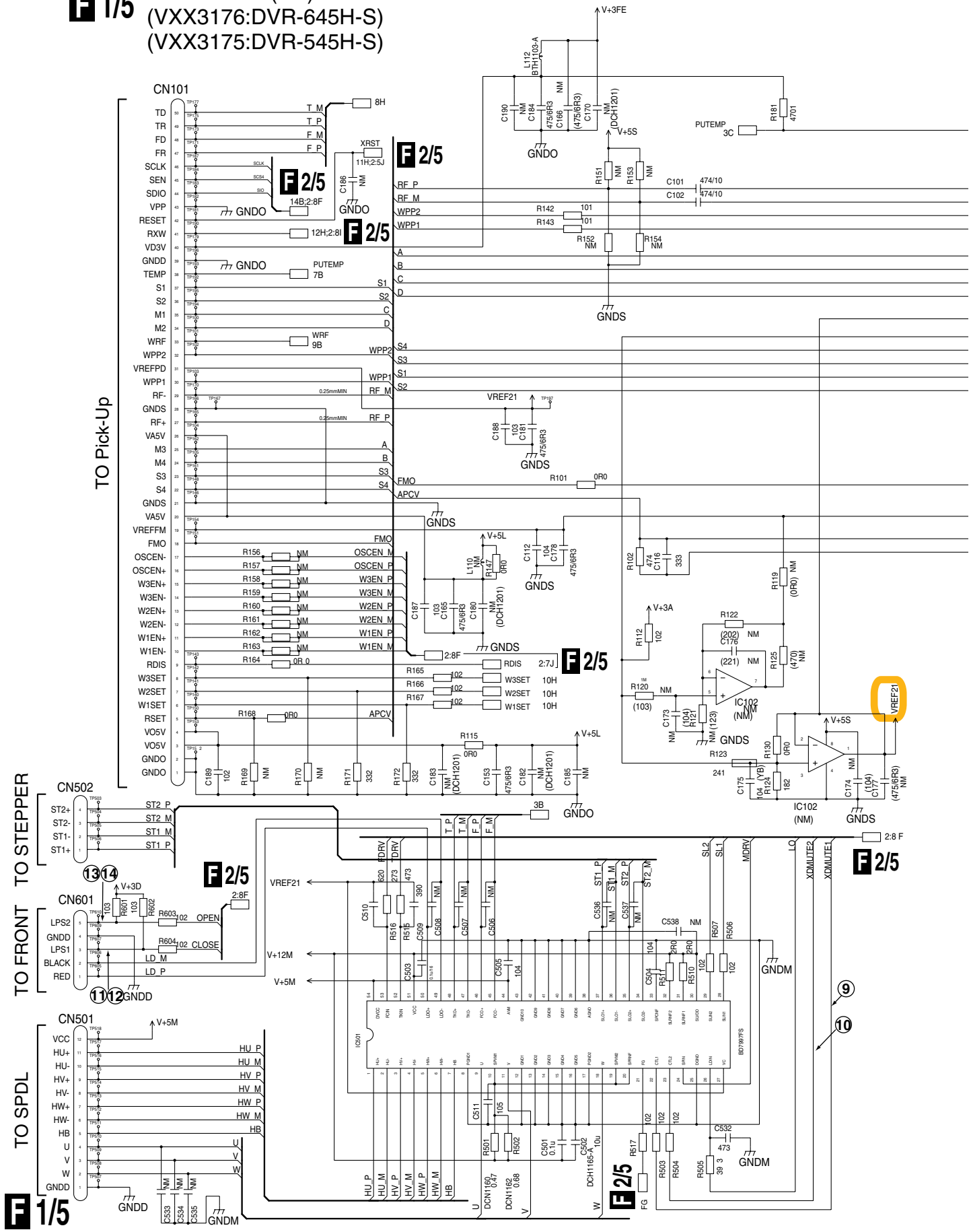
3.8 FJKB, FLKY and KEYB ASSYS

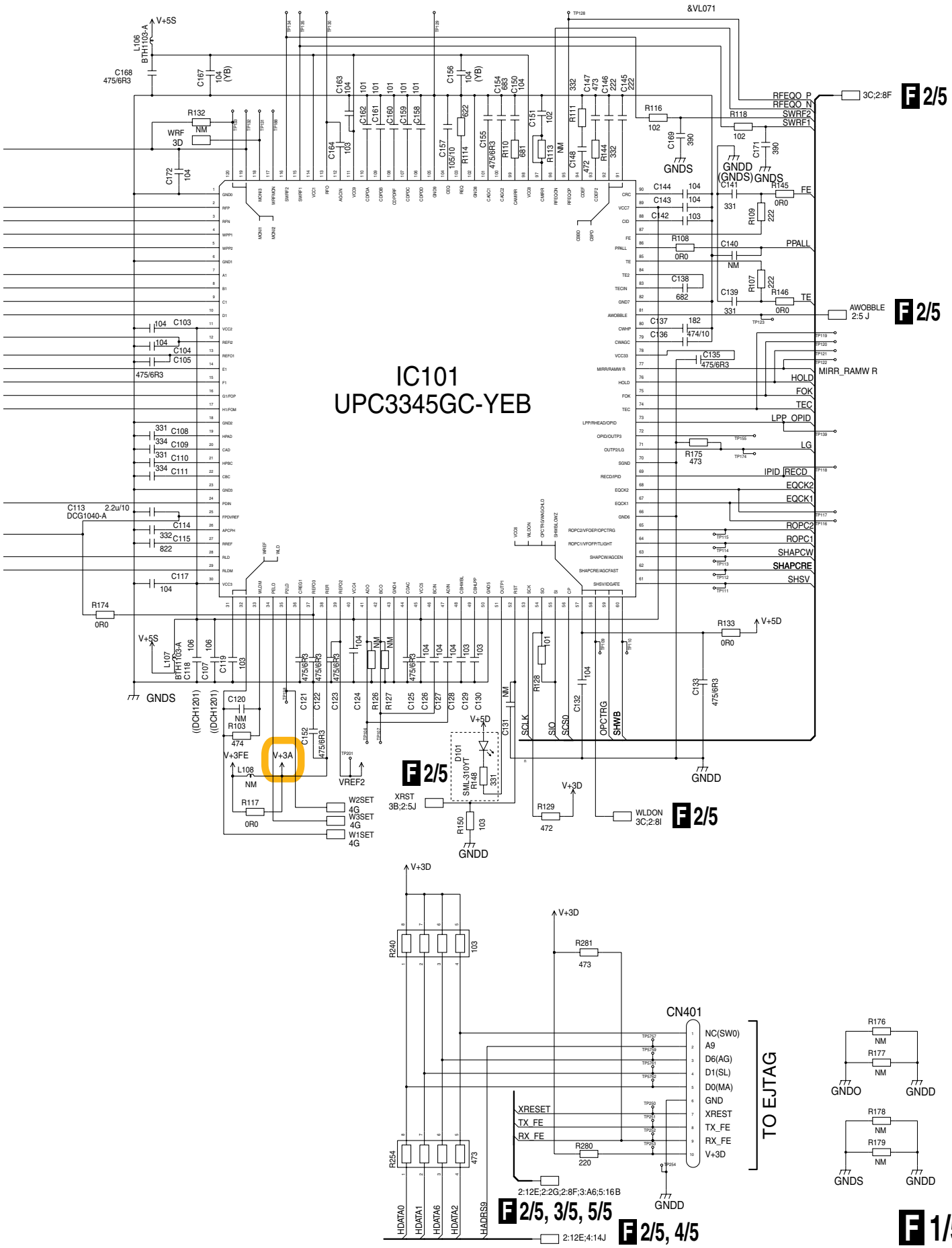



E KEYB ASSY
(VXX3112)
D J7001
CN7201
B3B-PH-K-S
KEY2
KEY3
GND
C7201
S7201
Standby/On
0V
C7202
S7202
TV Guide
0V
R7201
S7203
Left
0.90V
R7202
S7204
Right
1.53V
R7203
S7205
Down
2.18V
R7204
S7206
Up
2.85V
R7205
S7207
Enter
3.58V
SWITCHES
S7201 : Standby / On
KEY MATRIX
S7201-S7207: VSG1024-A-T

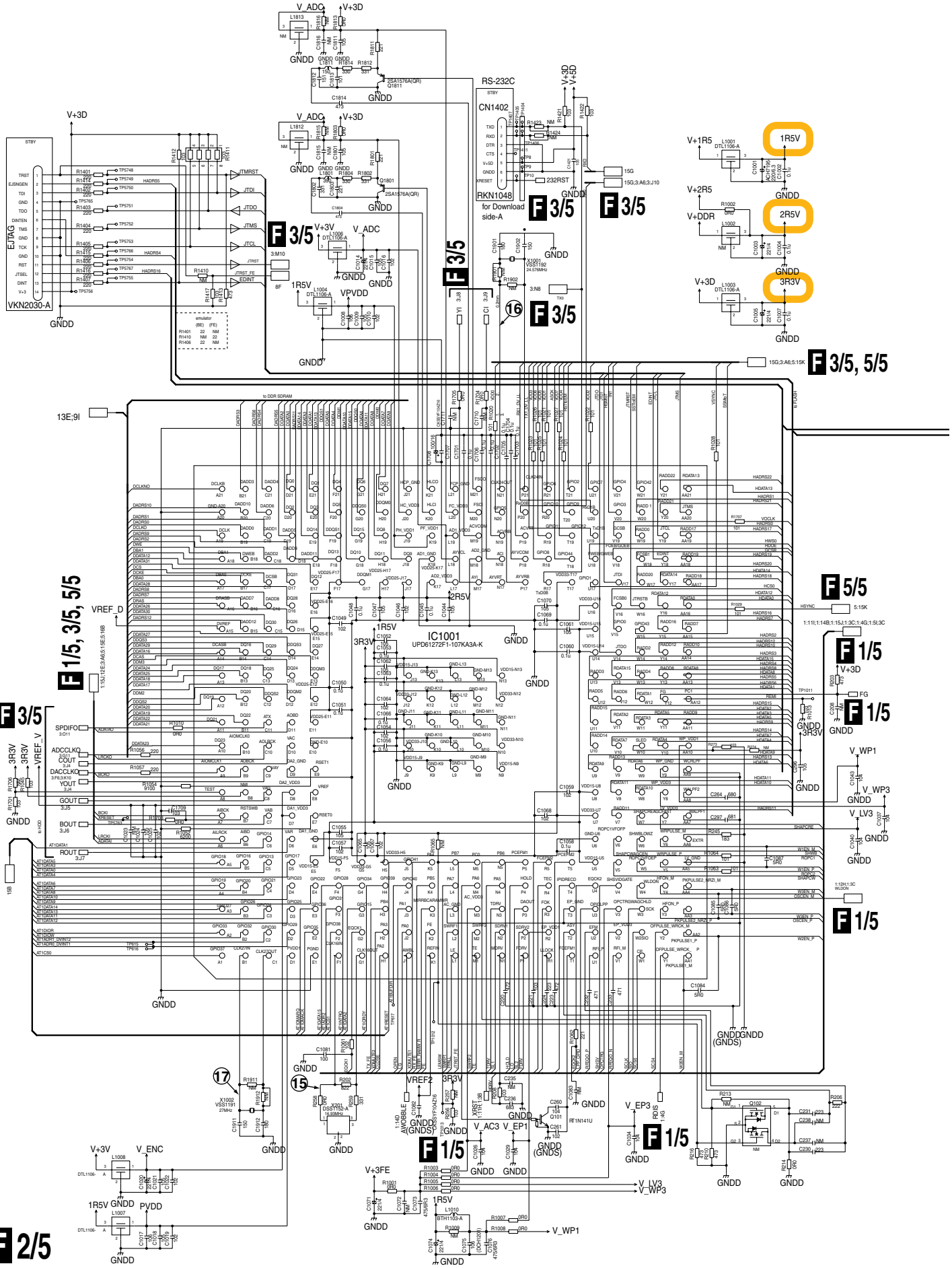

C FJKB ASSY
(VXX3113)
CN7302
9604S-12C(IRISO)
HLEM12S-1(FCI)
GND
FLSTB
FLCLK
FLDATA
GND
IR
V+5F
V+12R1E
FLPON
KEY1
KEY2
KEY3
D CN7001
CN7301
9604S-23C(IRISO)
HLEM23S-1(FCI)
A 1/4 CN101
2R
2L
2V
2Y
SDET2
2C
JA7301
AKP1238-B
S
JA7302
VKB1208-
VIDEO
Lch
/MONO
Rch
FRONT INPUT JACK
D7301-7304:
UMZ6R8N-TLB
D7301
D7302
D7303
D7304
D7305
C7306
C7307
C7301
C7302
C7303
C7304
C7305
R7301
R7302
R7303
R7304
R7305
R7306
R7307
R7308
VNF1084- -T
KN7301

F 1/5 MAIN ASSY (1/5)
(VXX3176:DVR-645H-S)
(VXX3175:DVR-545H-S)

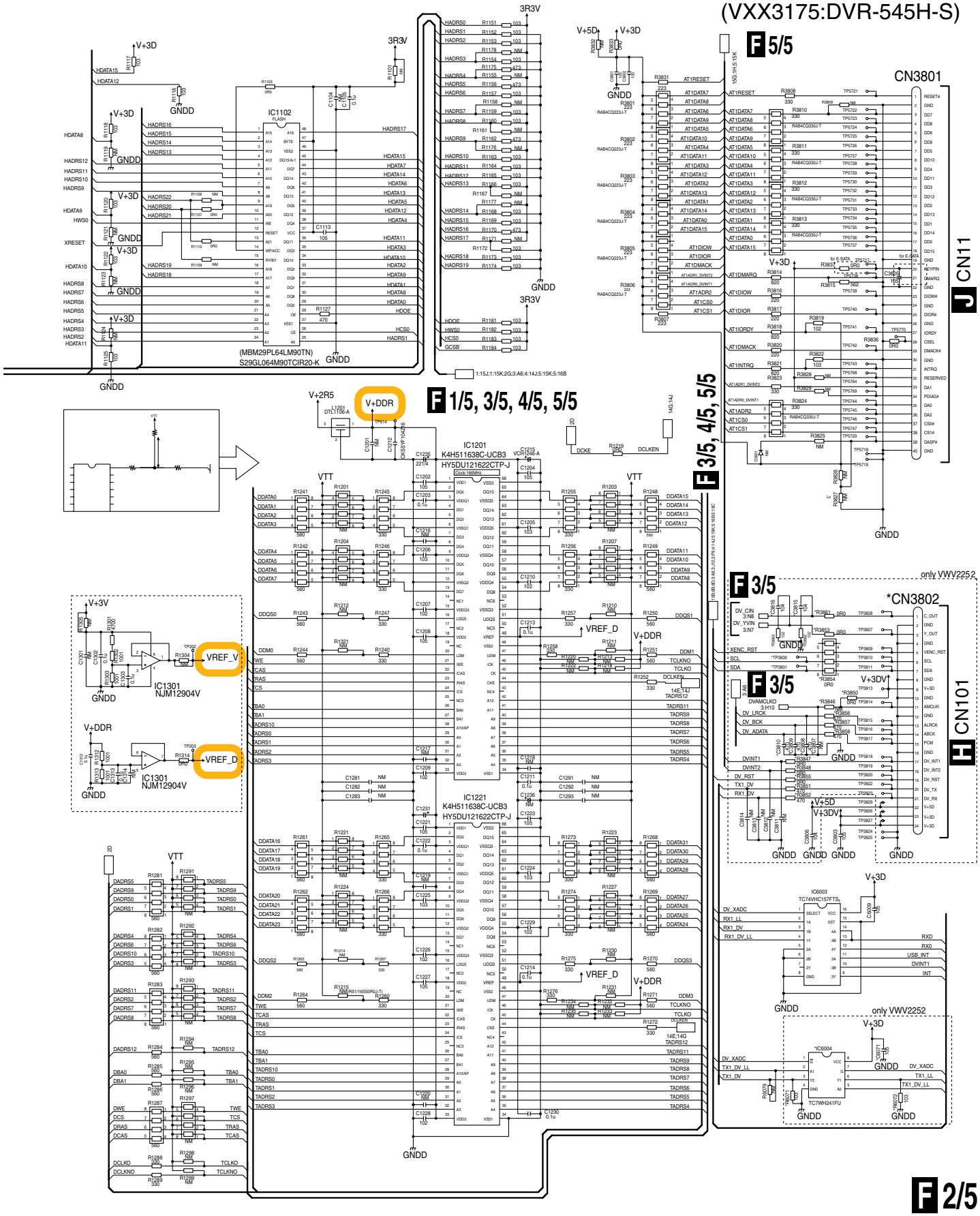



IC101
UPC3345GC-YEB
&VL071
V+5S
V+5D
V+3D
V+3A
V+3FE
GNDS
GNDD
GNDO
F 2/5
F 2/5, 3/5, 5/5
F 2/5, 4/5
F 1/5
RFEQO_P
RFEQO_N
SWRF2
SWRF1
FE
PPALL
TE
AWOBBLE
MIRR_RAMW R
HOLD
FOK
TEC
LPP_OPID
LG
IPID
RECD
EQCK2
EQCK1
ROPC2
ROPC1
SHAPCW
SHAPCRE
SHSV
SCLK
SIO
SCS0
OPCTRG
SHWB
WLDON
XRST
VREF2
W2SET
W3SET
W1SET
CN401
NC(SW0)
A9
D6(AG)
D1(SL)
D0(MA)
GND
XREST
TX_FE
RX_FE
V+3D
TO EJTAG
XRESET
TX_FE
RX_FE
HDATA0
HDATA1
HDATA6
HDATA2
HADRS9

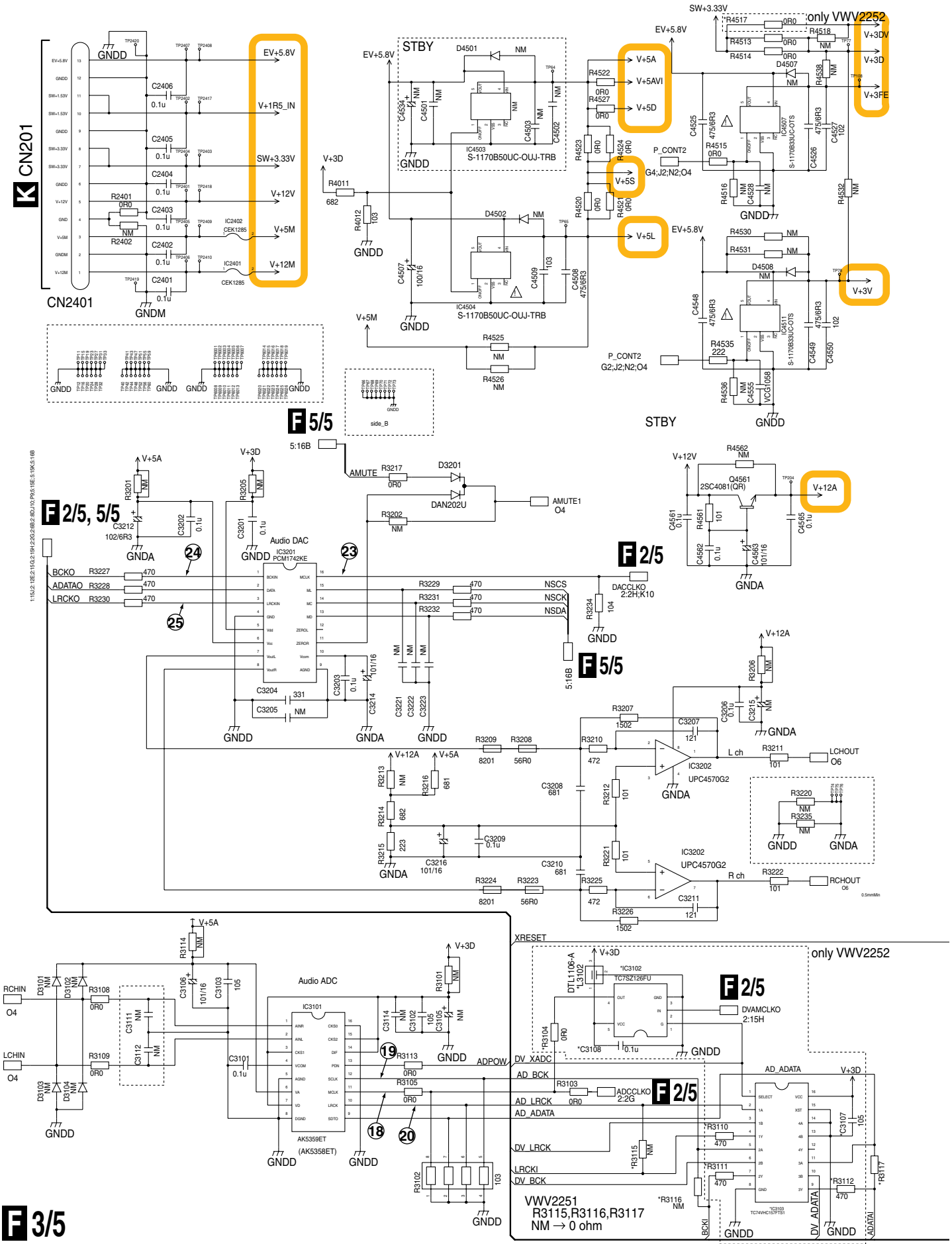
3.10 MAIN ASSY(2/5)

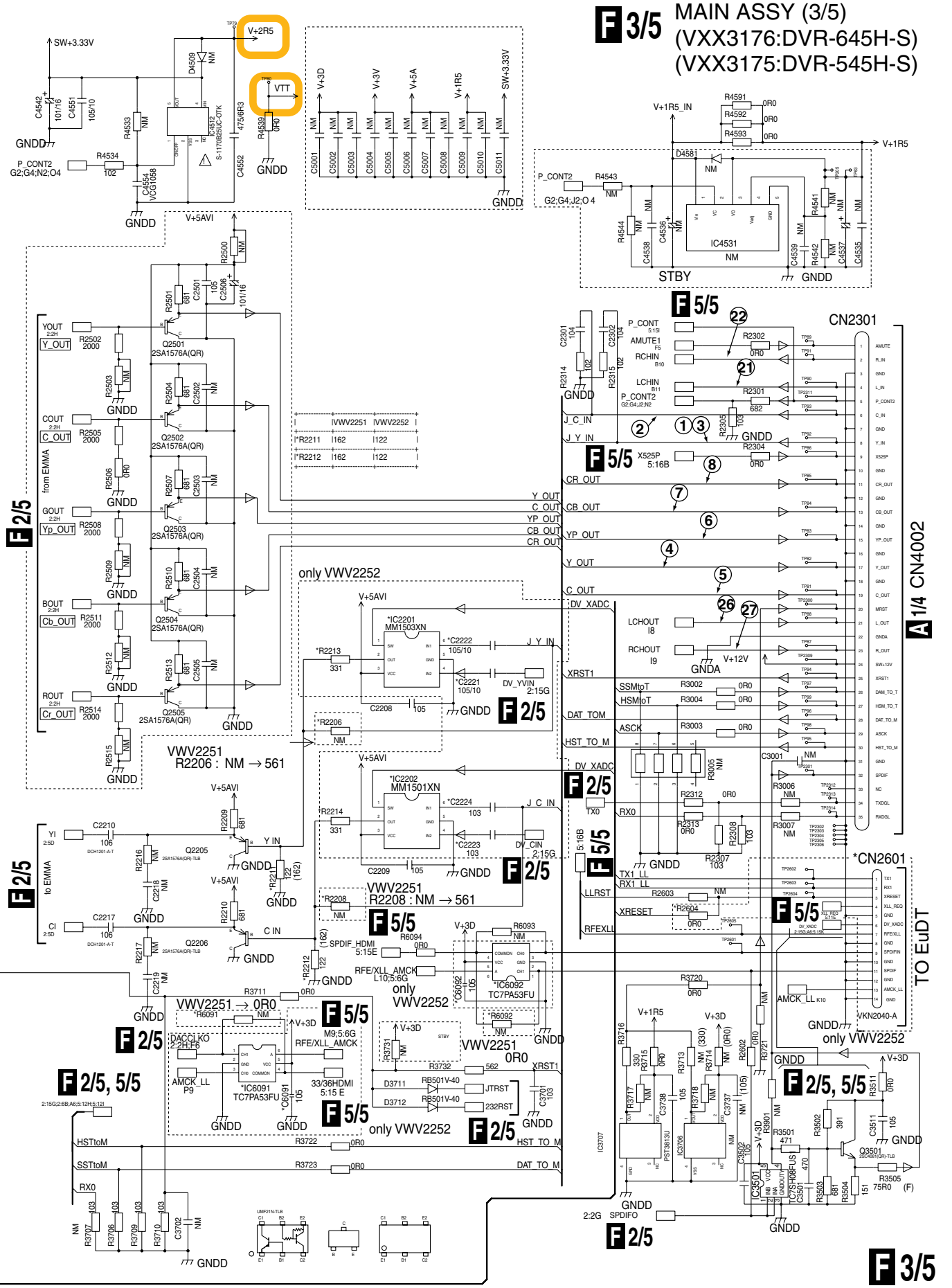


F 2/5 MAIN ASSY (2/5)
(VXX3176:DVR-645H-S)
(VXX3175:DVR-545H-S)

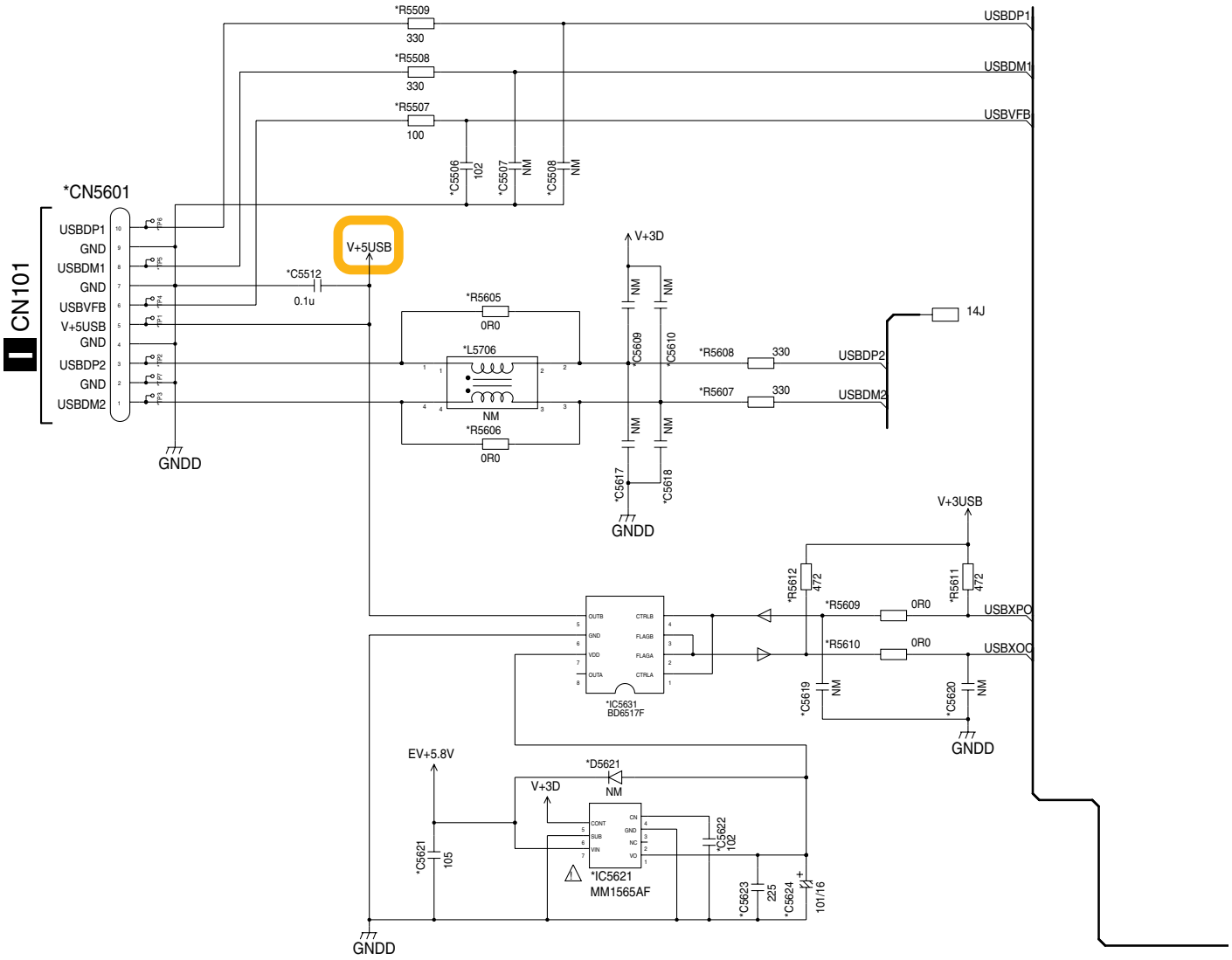


3.11 MAIN ASSY(3/5)



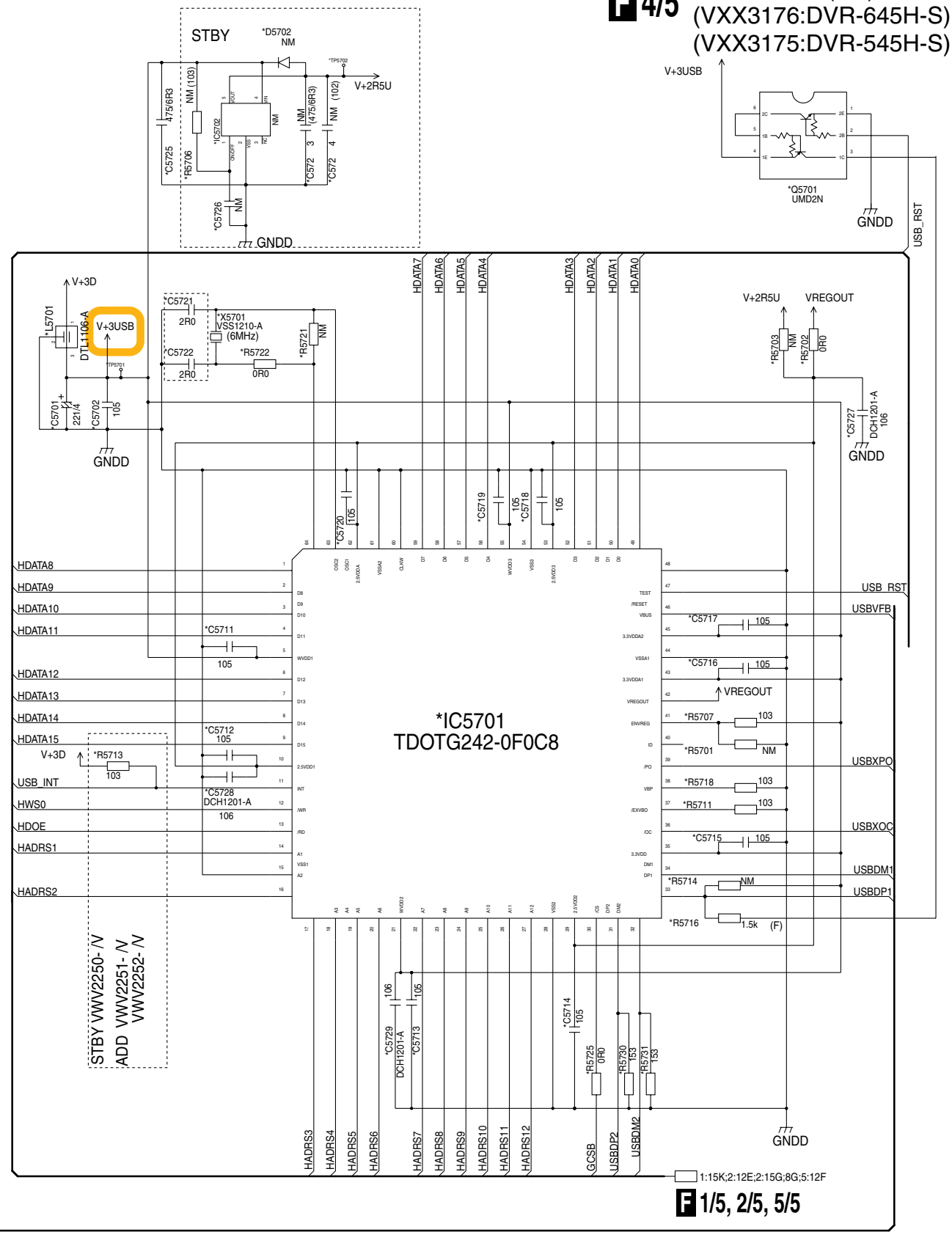

SW+3.33V
V+2R5
VTT
V+3D
V+3V
V+5A
V+1R5
SW+3.33V
GNDD
P_CONT2
G2;G4;N2;O4
V+5AVI
V+1R5_IN
V+1R5
STBY
IC4531
NM
F 5/5
CN2301
F 2/5
from EMMA
YOUT
COUT
GOUT
BOUT
ROUT
Y_OUT
C_OUT
Yp_OUT
Cb_OUT
Cr_OUT
Q2501
Q2502
Q2503
Q2504
Q2505
2SA1576A(QR)
VWV2251
VWV2252
only VWV2252
VWV2251
R2206 : NM → 561
VWV2251
R2208 : NM → 561
VWV2251 → 0R0
*IC2201
*IC2202
MM1503XN
*IC6091
*IC6092
TC7PA53FU
J_Y_IN
J_C_IN
DV_YVIN
DV_CIN
Y IN
C IN
SPDIF_HDMI
RFE/XLL_AMCK
DACCLKO
AMCK_LL
33/36HDMI
HSTtoM
SSTtoM
RX0
HST_TO_M
DAT_TO_M
JTRST
232RST
XRST1
P_CONT
AMUTE1
RCHIN
LCHIN
J_C_IN
J_Y_IN
CR_OUT
CB_OUT
YP_OUT
Y_OUT
C_OUT
DV_XADC
LCHOUT
RCHOUT
V+12V
GNDA
XRST1
SSMtoT
HSMtoT
DAT_TOM
ASCK
HST_TO_M
TX0
RX0
TX1_LL
RX1_LL
LLRST
XRESET
RFEXLL
AMCK_LL
A 1/4 CN4002
*CN2601
TO EuDT
VKN2040-A
only VWV2252
IC3707
PST3813U
IC3706
Q3501
2SC4081(QR)-TLB
C7SH08FU5
IC3501
SPDIFO
2:2G
F 3/5

3.12 MAIN ASSY(4/5)



F 4/5

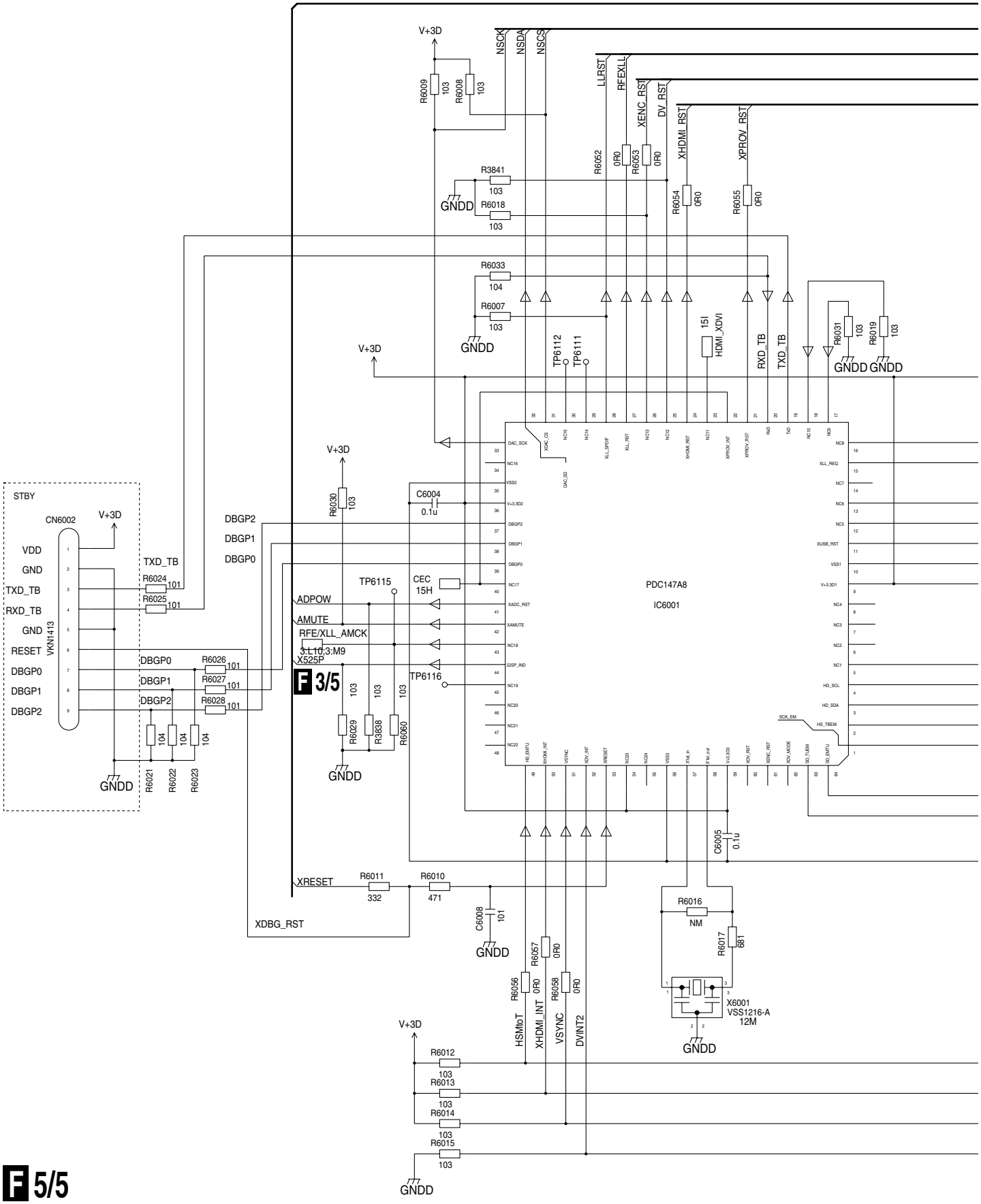
F 4/5 MAIN ASSY (4/5)
(VXX3176:DVR-645H-S)
(VXX3175:DVR-545H-S)

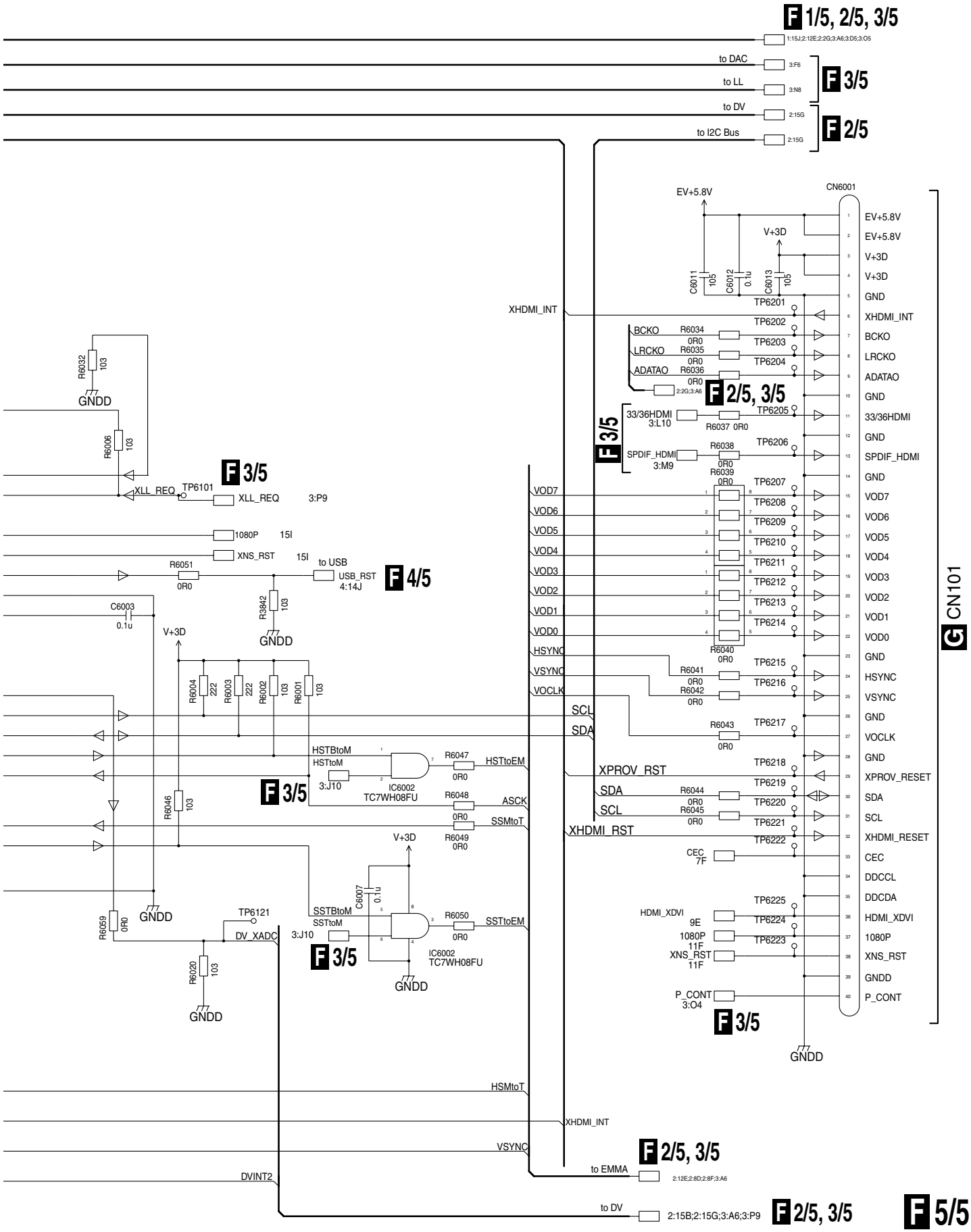


F 1/5, 2/5, 5/5

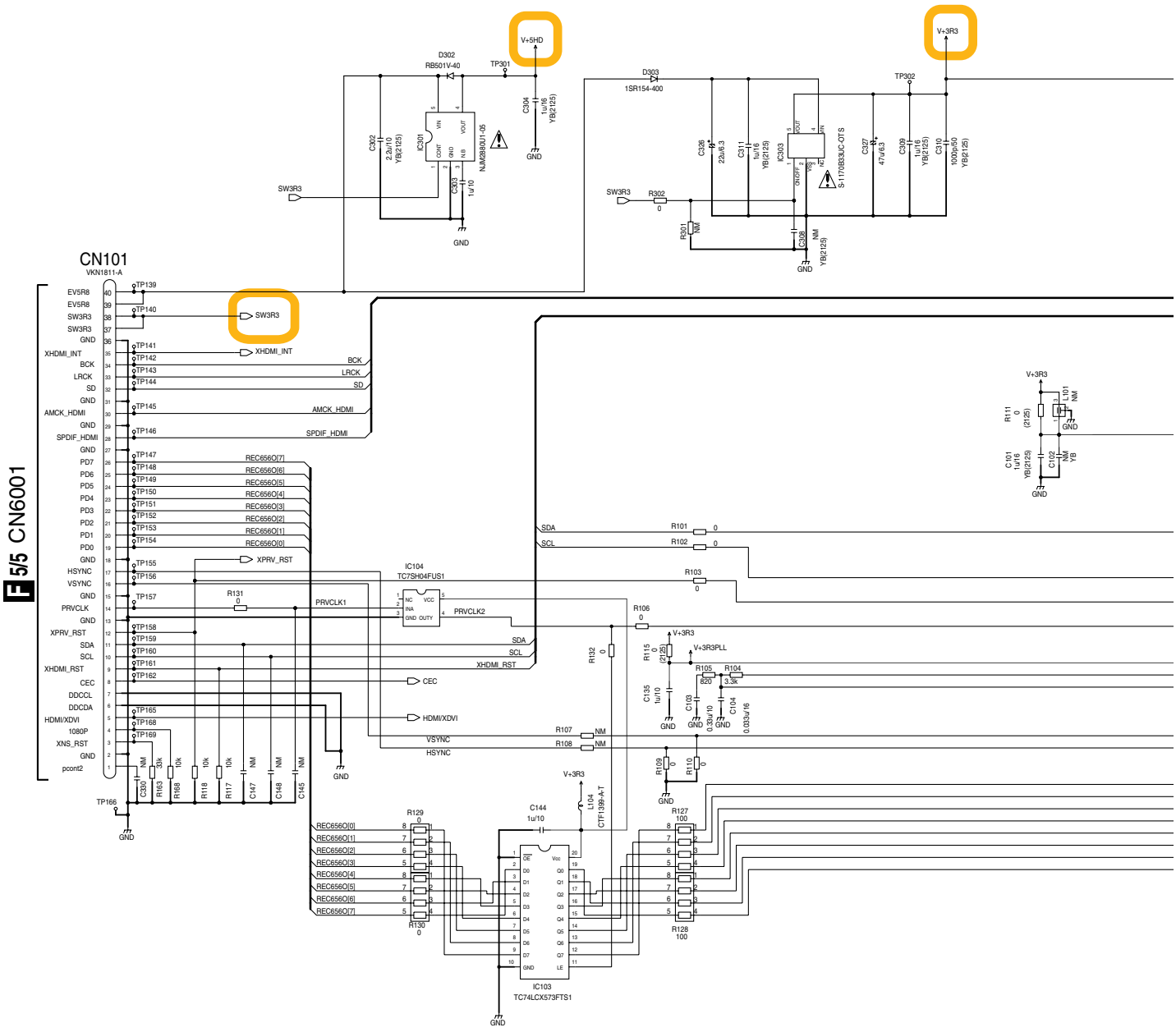
3.13 MAIN ASSY(5/5)

F 5/5 MAIN ASSY (5/5)
(VXX3176:DVR-645H-S)
(VXX3175:DVR-545H-S)



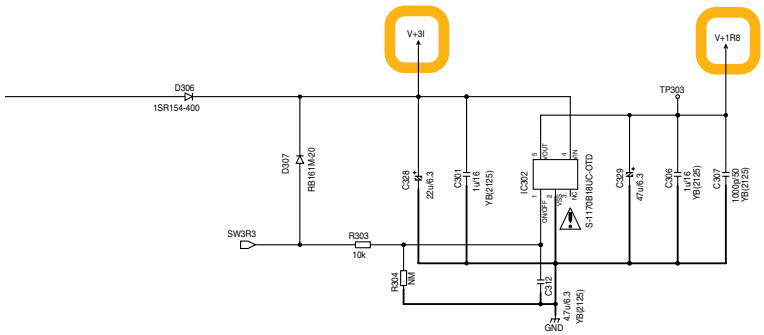

F 1/5, 2/5, 3/5
1:15J;2:12E;2:2G;3:A6;3:D5;3:O5
to DAC
3:F6
to LL
3:N8
F 3/5
to DV
2:15G
to I2C Bus
2:15G
F 2/5
CN6001
EV+5.8V
V+3D
C6011 105
C6012 0.1u
C6013 105
XHDMI_INT
BCKO R6034 0R0
LRCKO R6035 0R0
ADATAO R6036 0R0
2:2G;3:A6
F 2/5, 3:5
33/36HDMI 3:L10
R6037 0R0
SPDIF_HDMI 3:M9
R6038 0R0
R6039 0R0
R6040 0R0
R6041 0R0
R6042 0R0
R6043 0R0
F 3/5
R6032 103
GNDD
R6006 103
XLL_REQ
TP6101
XLL_REQ 3:P9
1080P 15I
XNS_RST 15I
to USB
R6051 0R0
USB_RST 4:14J
F 4/5
R3842 103
C6003 0.1u
V+3D
R6004 222
R6003 222
R6002 103
R6001 103
HSTBtoM
HSTtoM
3:J10
IC6002
TC7WH08FU
R6047 0R0
HSTtoEM
R6048 0R0
ASCK
R6046 103
R6049 0R0
SSMtoT
C6007 0.1u
SSTBtoM
SSTtoM
3:J10
R6050 0R0
SSTtoEM
IC6002
TC7WH08FU
R6059 0R0
TP6121
DV_XADC
R6020 103
VOD7
VOD6
VOD5
VOD4
VOD3
VOD2
VOD1
VOD0
HSYNC
VSYNC
VOCLK
SCL
SDA
XPROV_RST
SDA
SCL
XHDMI_RST
CEC 7F
HDMI_XDVI 9E
1080P 11F
XNS_RST 11F
P_CONT 3:O4
F 3/5
GNDD
TP6201
TP6202
TP6203
TP6204
TP6205
TP6206
TP6207
TP6208
TP6209
TP6210
TP6211
TP6212
TP6213
TP6214
TP6215
TP6216
TP6217
TP6218
TP6219
TP6220
TP6221
TP6222
TP6225
TP6224
TP6223
CN101
EV+5.8V
EV+5.8V
V+3D
V+3D
GND
XHDMI_INT
BCKO
LRCKO
ADATAO
GND
33/36HDMI
GND
SPDIF_HDMI
GND
VOD7
VOD6
VOD5
VOD4
VOD3
VOD2
VOD1
VOD0
GND
HSYNC
VSYNC
GND
VOCLK
GND
XPROV_RESET
SDA
SCL
XHDMI_RESET
CEC
DDCCL
DDCDA
HDMI_XDVI
1080P
XNS_RST
GNDD
P_CONT
HSMtoT
XHDMI_INT
VSYNC
DVINT2
to EMMA
2:12E;2:8D;2:8F;3:A6
F 2/5, 3/5
to DV
2:15B;2:15G;3:A6;3:P9
F 2/5, 3/5
F 5/5

3.14 HDMIB ASSY(1/2)



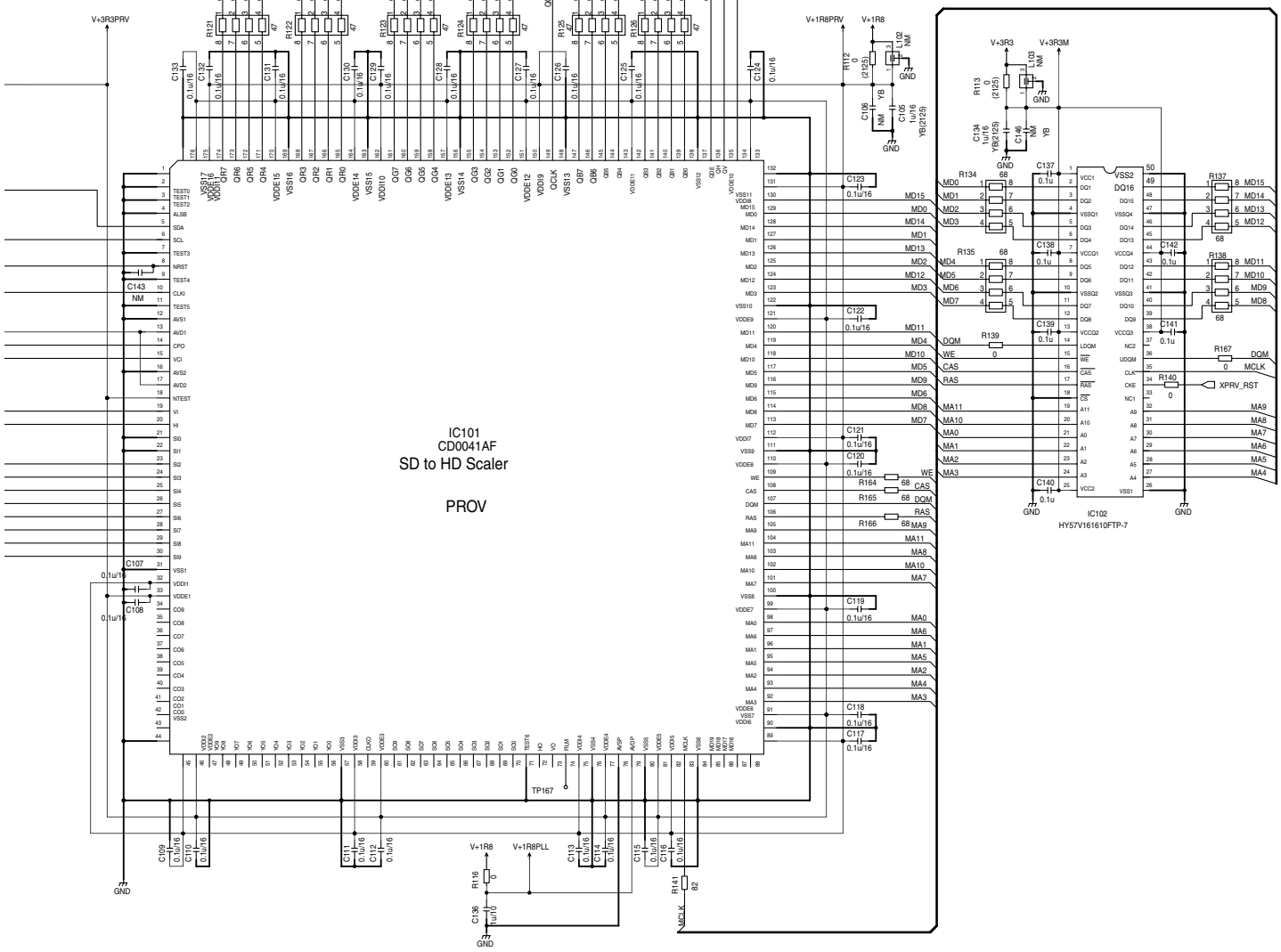
G 1/2

G 1/2 HDMIB ASSY (1/2) (VWV2247)



Transmitter Audio_IN
PROV & Transmitter_control
Transmitter_Video_IN

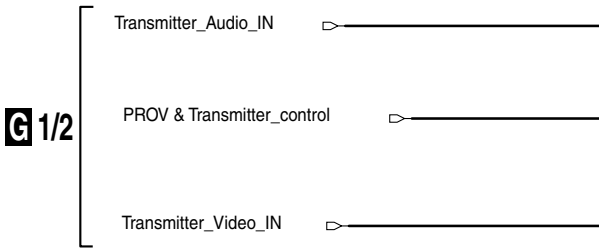
G 2/2



3.15 HDMIB ASSY(2/2)

A

B



C

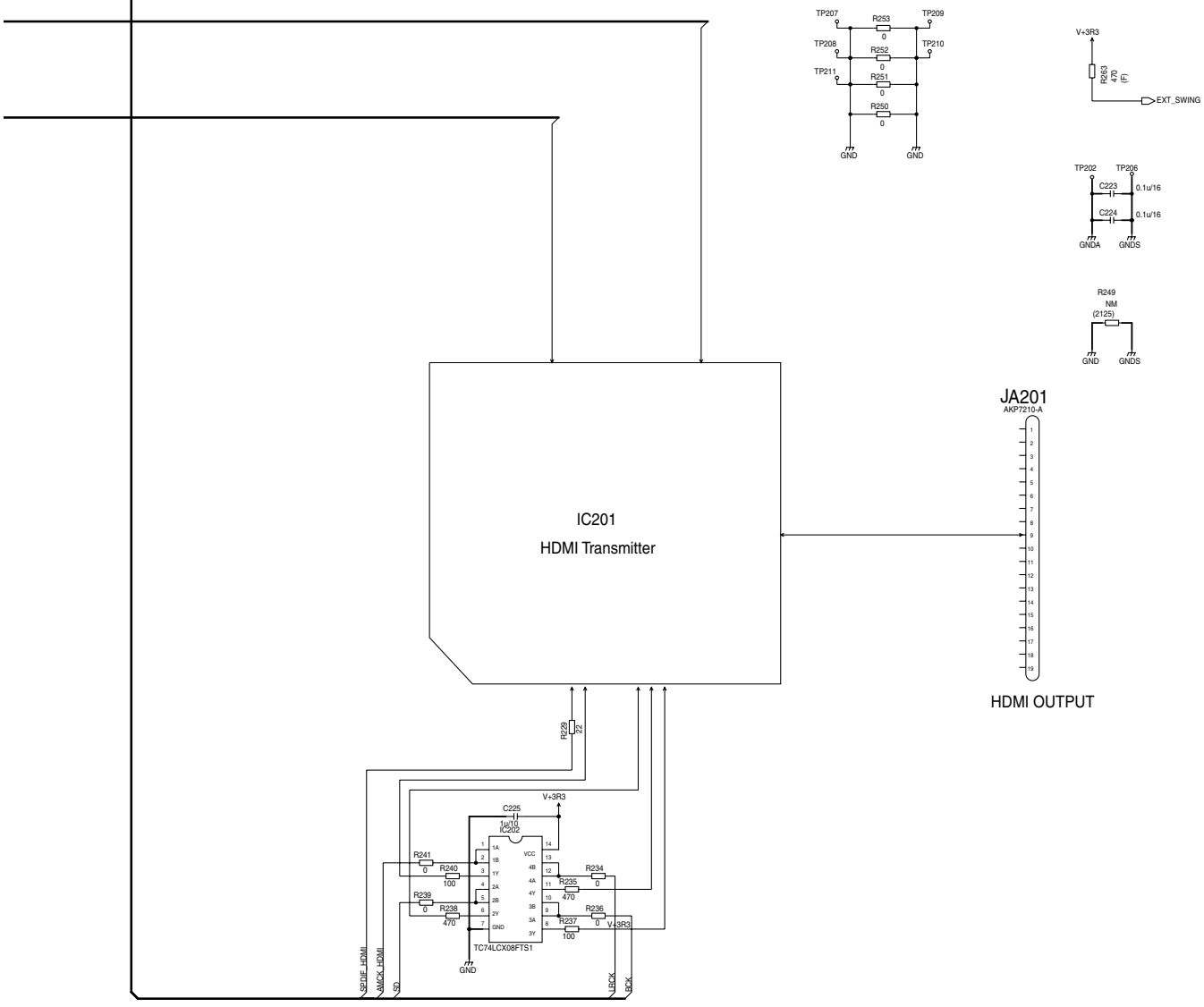
D

E

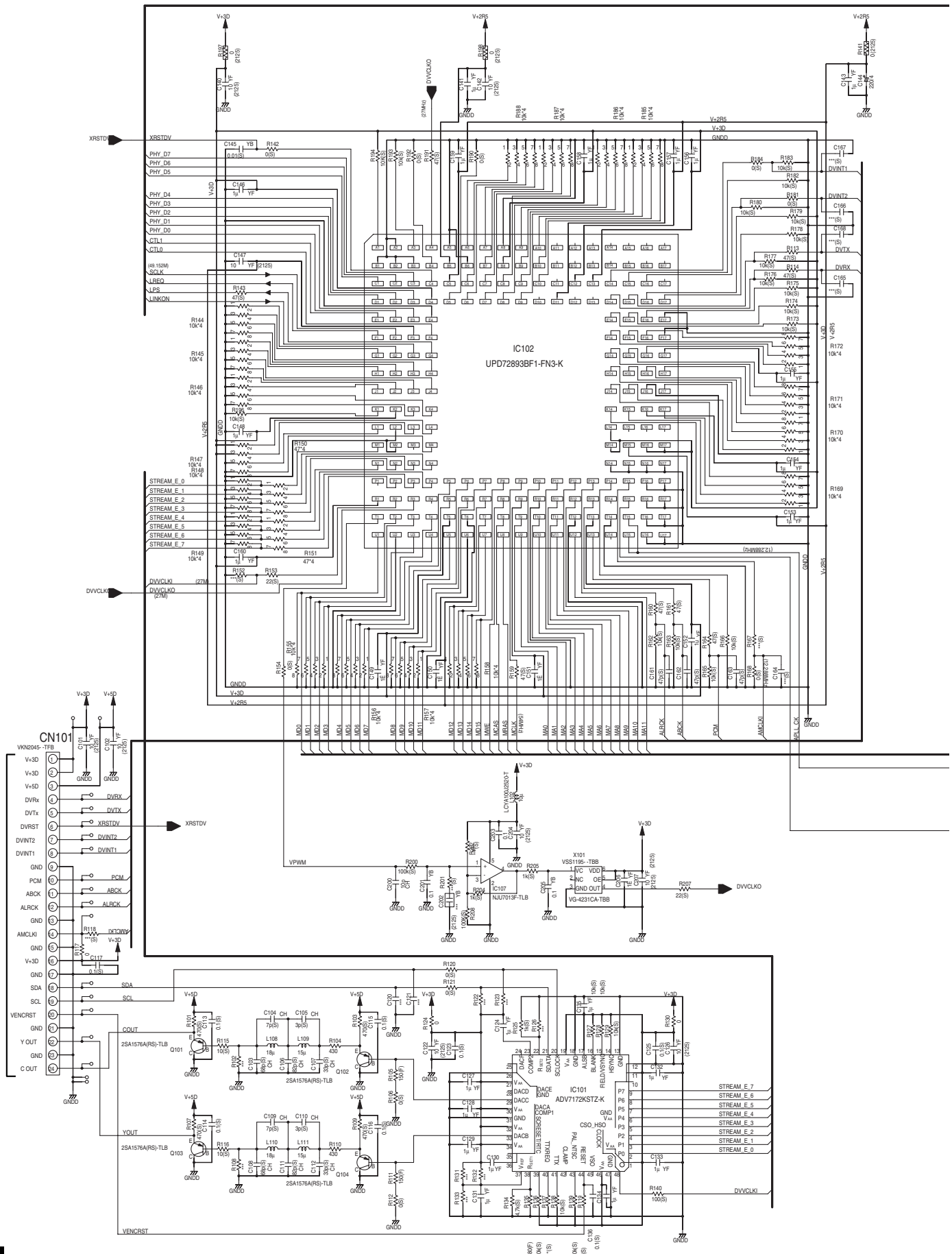
F

G 2/2

G 2/2 HDMIB ASSY (2/2) (VWV2247)

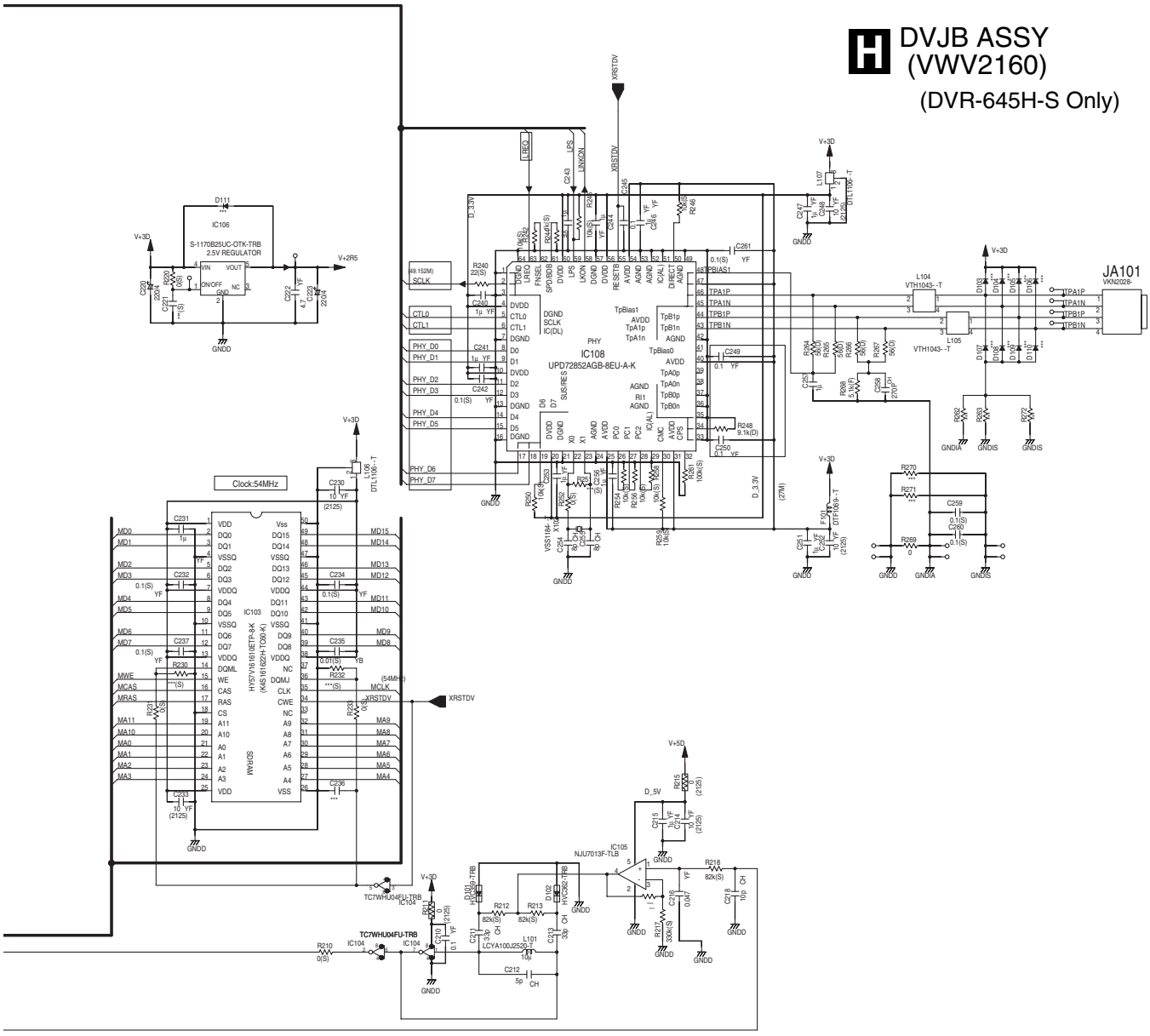


3.16 DVJB ASSY (DVR-645H-S Only)



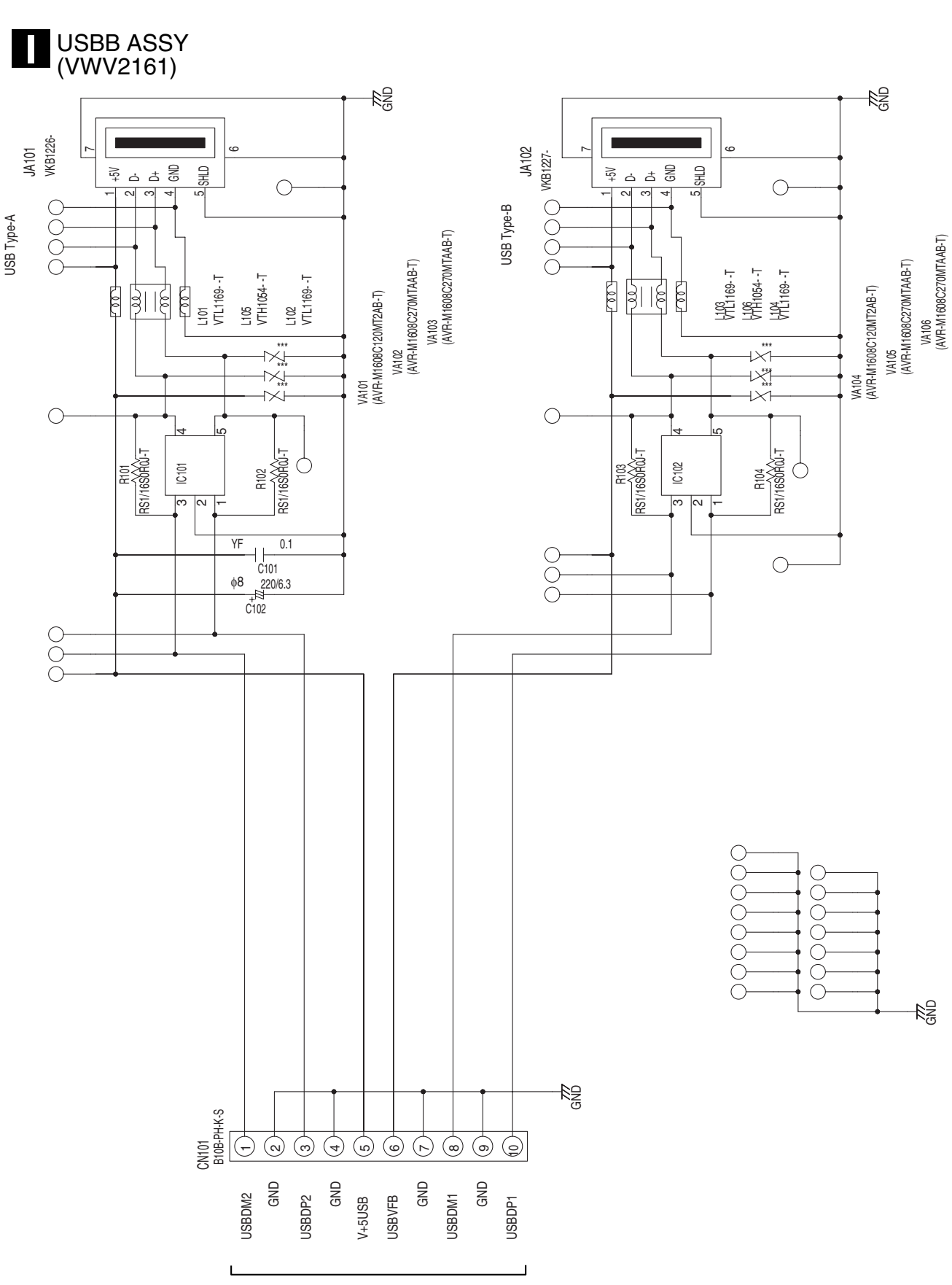
DVJB ASSY (VWV2160)

(DVR-645H-S Only)



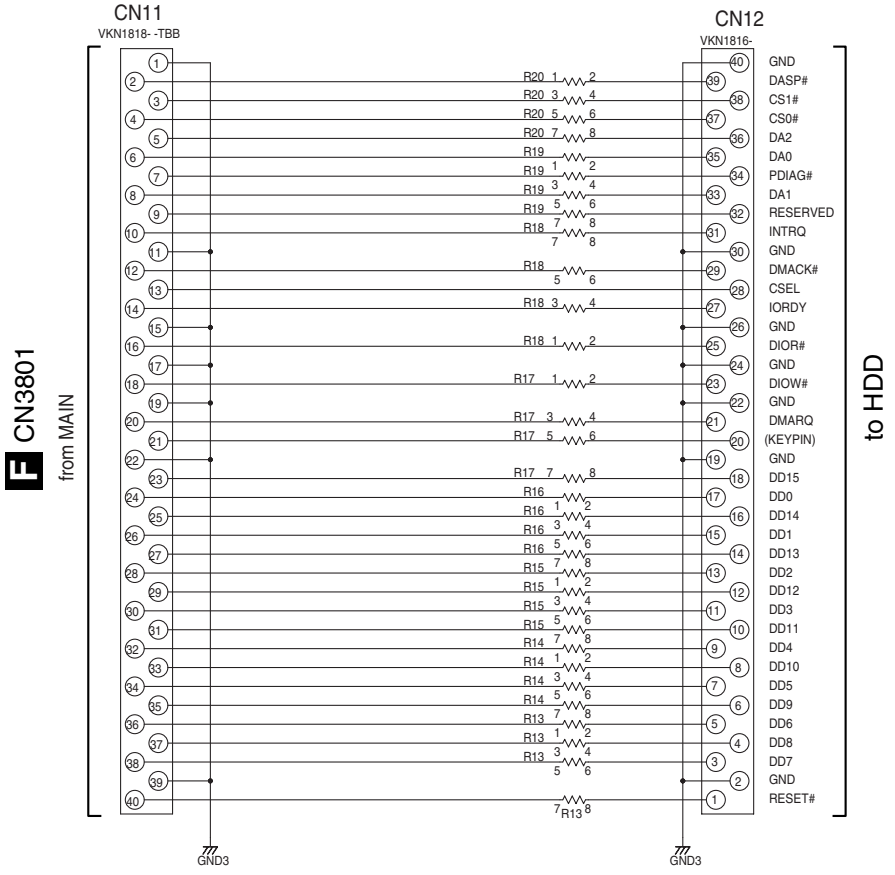
DVR-645H-S

3.17 USBB ASSY (DVR-645H-S Only)



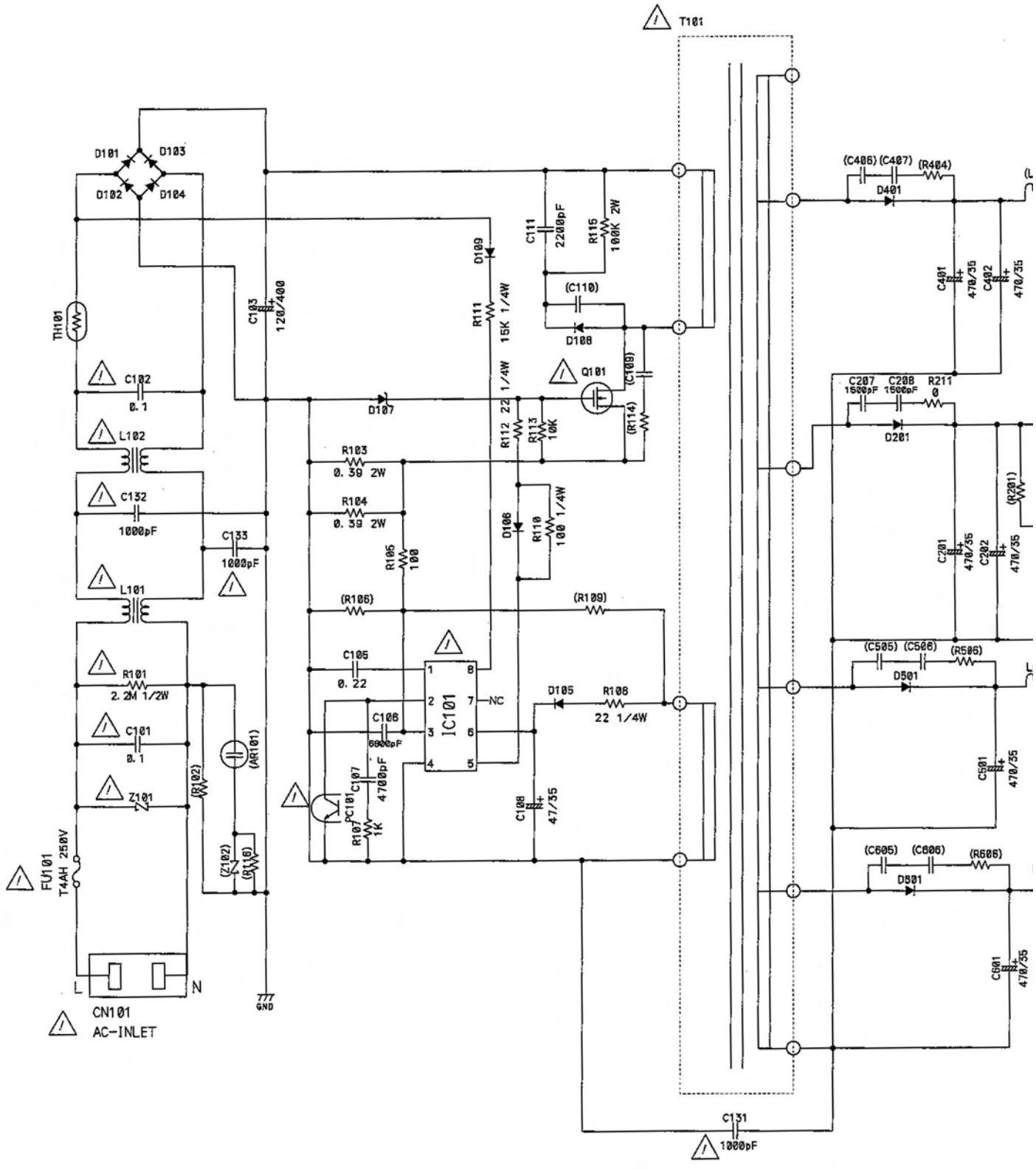
3.18 ATAB ASSY

J ATAB ASSY (VXX3140)

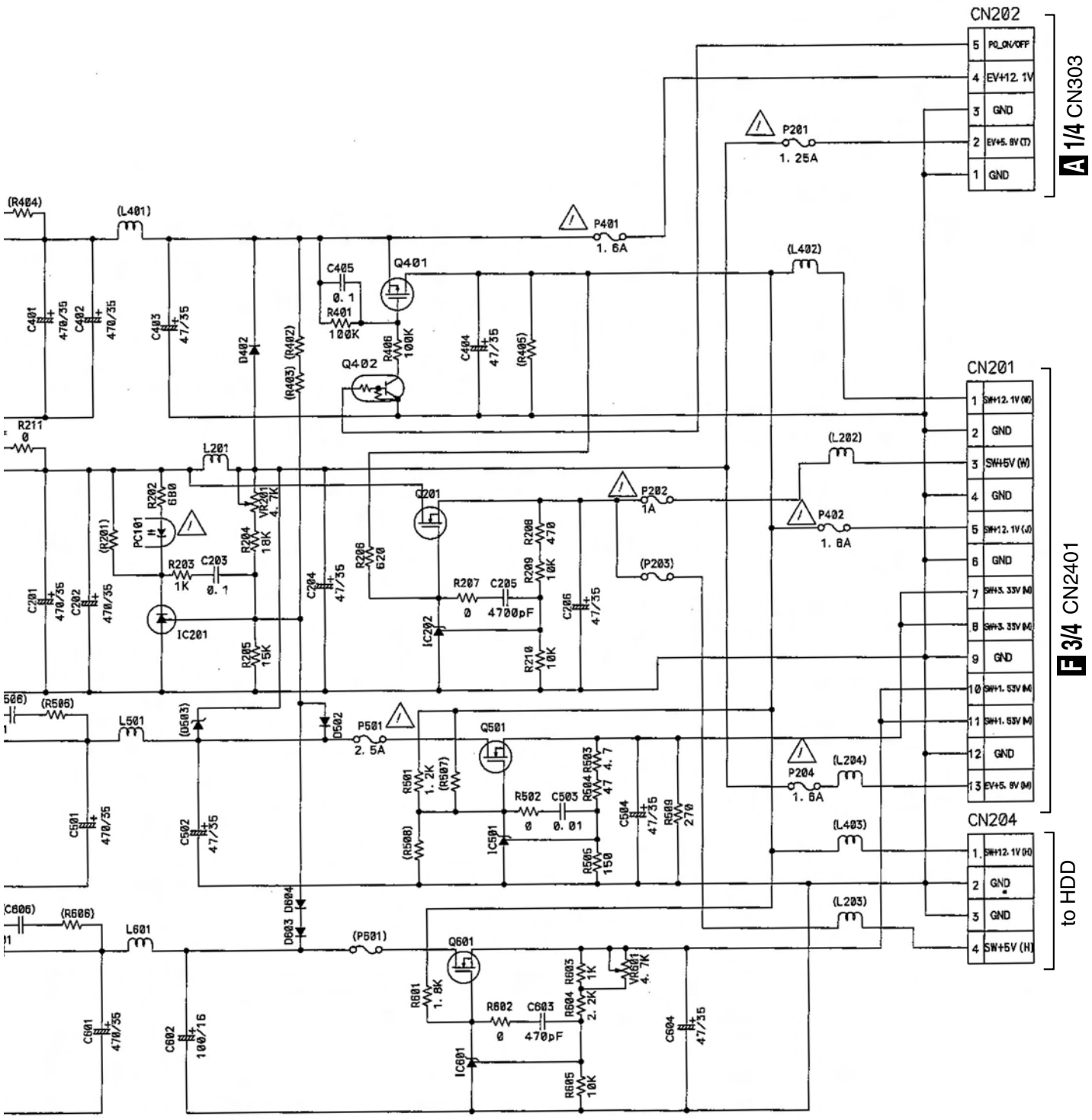


3.19 POWER SUPPLY UNIT

K POWER SUPPLY UNIT (VWR1399)



Unit	Resistor	Ω/W (under 1/4W for no direction W
	Capacitor	μF/V (under 50V for no direction V

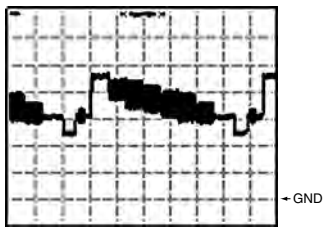

CN202
5 PO_ON/OFF
4 EV+12. 1V
3 GND
2 EV+5. 8V (T)
1 GND
A 1/4 CN303
P201
1. 25A
P401
1. 6A
(R404)
(L401)
(L402)
C405
0. 1
Q401
R401
100K
R406
100K
Q402
C401
470/35
C402
470/35
C403
47/35
C404
47/35
D402
(R402)
(R403)
(R405)
CN201
1 SW+12. 1V (M)
2 GND
3 SW+5V (M)
4 GND
5 SW+12. 1V (J)
6 GND
7 SW+3. 35V (M)
8 SW+3. 35V (M)
9 GND
10 SW+1. 53V (M)
11 SW+1. 53V (M)
12 GND
13 EV+5. 8V (M)
F 3/4 CN2401
R211
0
L201
(L202)
P202
1A
P402
1. 8A
(P203)
Q201
R202
680
PC101
R201
VR201
4. 7K
R204
18K
R203
1K
C203
0. 1
IC201
R205
15K
C201
470/35
C202
470/35
C204
47/35
R206
620
R207
0
C205
4700pF
IC202
R208
470
R209
10K
R210
10K
C206
47/35
(R506)
L501
(D503)
D502
P501
2. 5A
Q501
R501
1. 2K
(R507)
R502
0
C503
0. 01
R503
47
R504
4. 7
C504
47/35
R509
270
(R508)
IC501
R505
150
C501
470/35
C502
47/35
P204
1. 8A
(L204)
CN204
1. SW+12. 1V (M)
2 GND
3 GND
4 SW+5V (M)
to HDD
(L403)
(L203)
(R606)
L601
D603
D604
(P501)
Q601
R601
1. 8K
R602
0
C603
470pF
R603
1K
VR601
4. 7K
R604
2. 2K
IC601
R605
10K
C601
470/35
C602
100/16
C604
47/35

3.20 WAVE FORMS

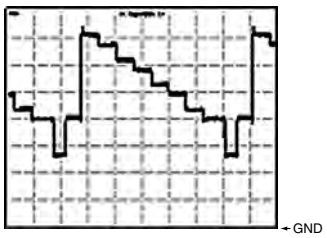
Note : The encircled numbers denote measuring point in the schematic diagram.

A TUJB ASSY

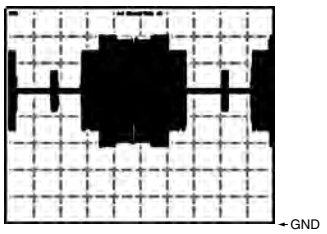
1 **IC100-pin18 (TU-VIN)**
(Function : Tuner 9ch)
V:500mV/div. H:10μsec/div.



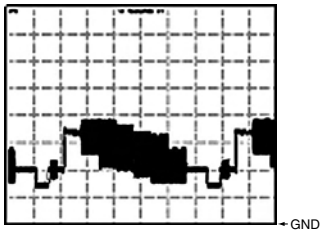
2 **C2036+side (Y1OUT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



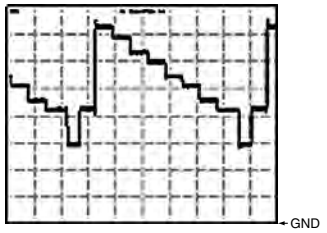
3 **IC100-pin34 (C1OUT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



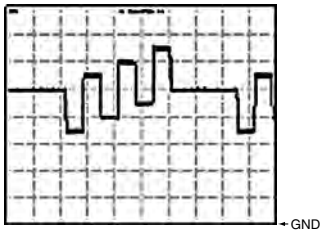
4 **C2037+side (V1OUT)**
(Function : DVD play)
V:1V/div. H:10μsec/div.



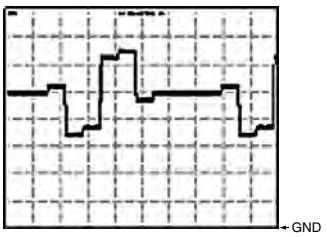
5 **C2035+side (YOUT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



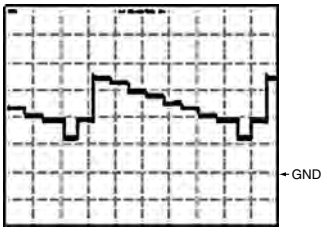
6 **C2034+side (CbOUT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



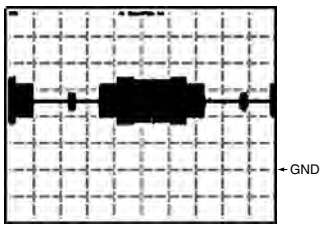
7 **C2033+side (CrOUT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



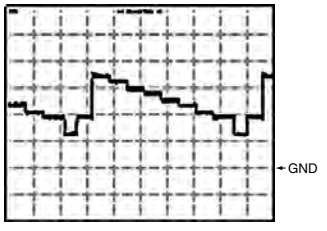
8 **CN4002-pin19 (Y_OUT MtoT)**
(Function : Tuner 9ch)
V:500mV/div. H:10μsec/div.



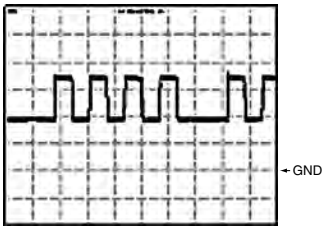
9 **CN4002-pin17 (C_OUT MtoT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



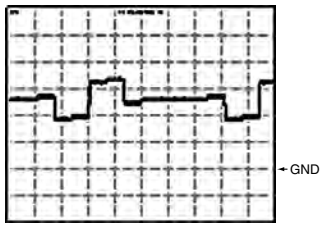
10 **CN4002-pin21 (Yp_OUT MtoT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



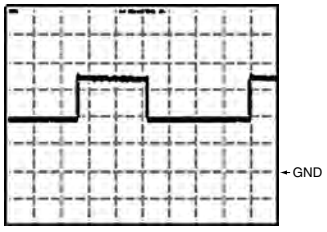
11 **CN4002-pin23 (Cb_OUT MtoT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



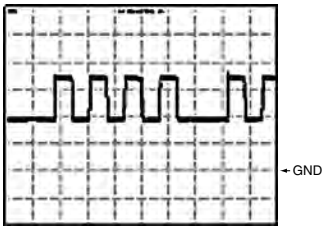
12 **CN4002-pin25 (Cr_OUT MtoT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



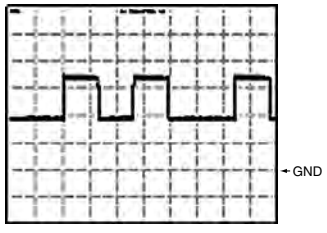
13 **CN4002-pin21 (Y/G_OUT MtoT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



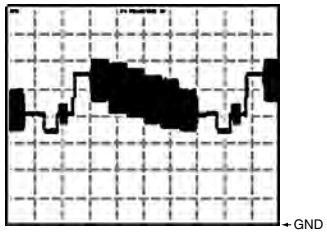
14 **CN4002-pin23 (Cb/B_OUT MtoT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



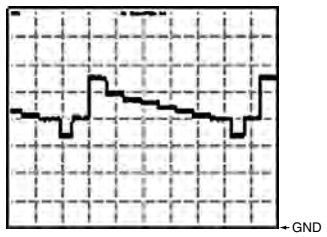
15 **CN4002-pin25 (Cr/R_OUT MtoT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



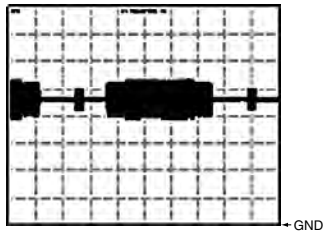
16 **IC100-pin14 (2VIN)**
(Function : LINE2 IN)
V:500mV/div. H:10μsec/div.



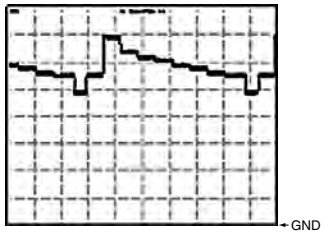
17 **IC100-pin7 (Y2IN)**
(Function : LINE2 IN)
V:500mV/div. H:10μsec/div.



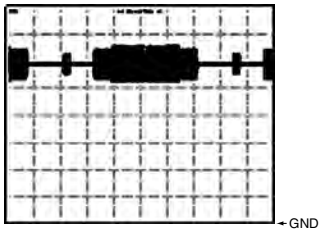
18 **IC100-pin9 (C2IN)**
(Function : LINE2 IN)
V:500mV/div. H:10μsec/div.



19 **CN4002-pin28 (Y_IN TtoM)**
(Function : LINE2 IN)
V:500mV/div. H:10μsec/div.



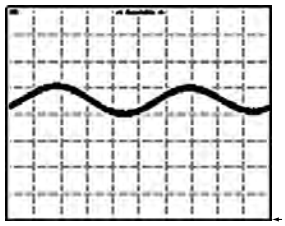
20 **CN4002-pin30 (C_IN TtoM)**
(Function : LINE2 IN)
V:500mV/div. H:10μsec/div.



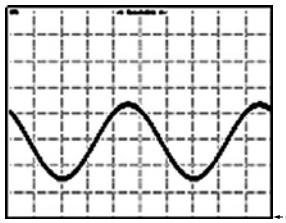
A TUJB ASSY

Measurement Condition :

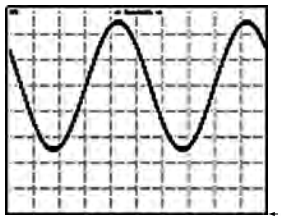
21 **IC100-pin87 (TU-LIN)**
(Function : Tuner 9ch)
V:500mV/div. H:10μsec/div.



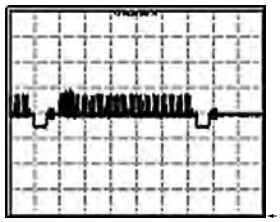
22 **C2038+side (L_OUT)**
Function : DVD play)
V:500mV/div. H:10μsec/div.



23 **CN4002-pin32 (L_IN)**
(Function : LINE2 IN)
V:500mV/div. H:10μsec/div.



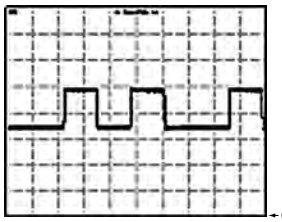
24 **IC101-pin81 (TEXTV)**
(Function : RF IN)
V:1V/div. H:10μsec/div.



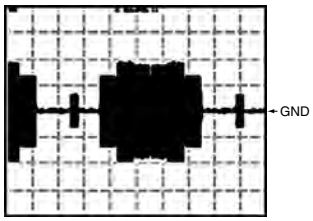
B SCRB ASSY

Measurement Condition :

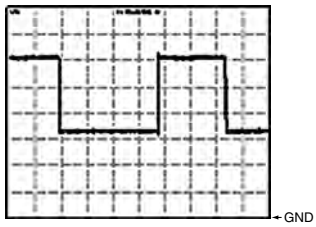
1 **JA801-pin15 (R/C IN)**
(Function : LINE1 IN)
V:500mV/div. H:10μsec/div.



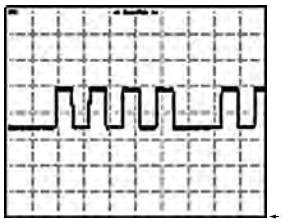
5 **JA801-pin15 (R/C IN)**
(Function : LINE1 IN)
V:500mV/div. H:10μsec/div.



9 **CN1-pin24 (AV1_G_OUT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.

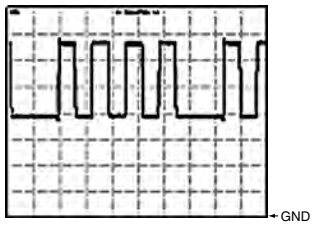


2 **JA801-pin7 (BIN)**
(Function : LINE1 IN)
V:500mV/div. H:10μsec/div.

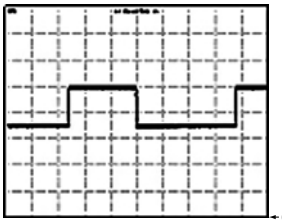


6 **CN1-pin29 (AV1_V/Y_OUT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.

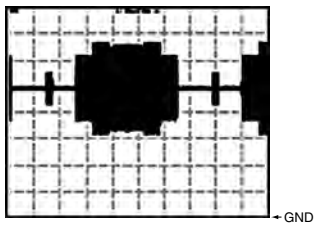
10 **CN1-pin12 (AV1_B_OUT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



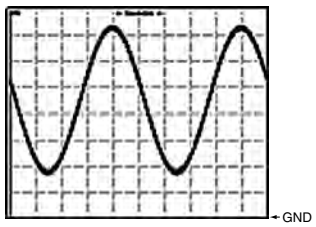
3 **JA801-pin11 (G IN)**
(Function : LINE1 IN)
V:500mV/div. H:10μsec/div.



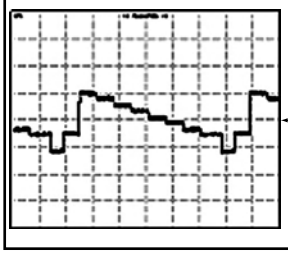
7 **CN1-pin26 (AV1_R/C_OUT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



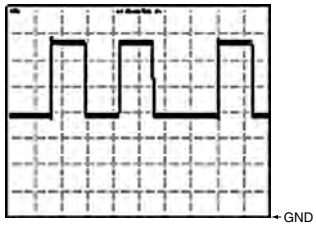
11 **CN1-pin4 (AV1_L_OUT)**
(Function : DVD play)
V:500mV/div. H:10μsec/div.



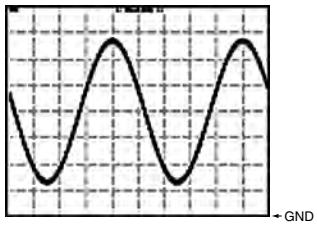
4 **JA801-pin20 (AV2_V/Y IN))**
(Function : LINE1 IN)
V:1V/div. H:10μsec/div.



8 **CN1-pin26 (AV1_R/C_OUT)**
(Function : DVD play)
V:1V/div. H:10μsec/div.



12 **JA801-pin6 (AV2_L_IN)**
(Function : LINE1 IN)
V:1V/div. H:10μsec/div.

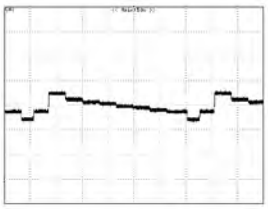


F MAIN ASSY

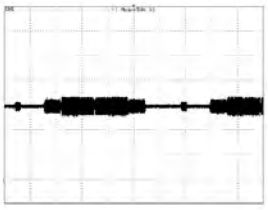
Measurement Condition :

No.1 - 8 : EBU Color Bar (100 / 0 / 75 / 0)

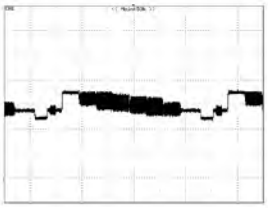
1 CN2301 Pin8 (Y_IN)
V: 1V/div. H: 10us/div.



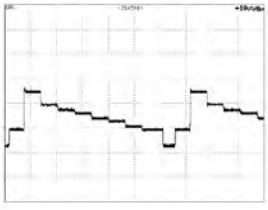
2 CN2301 Pin6 (C_IN)
V: 1V/div. H: 10us/div.



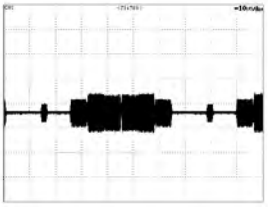
3 CN2301 Pin_8 (CVBS_IN)
V: 1V/div. H: 10us/div.



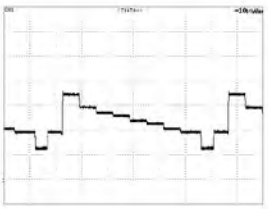
4 CN2301 Pin17 (Y_OUT)
V: 0.5V/div. H: 10us/div.



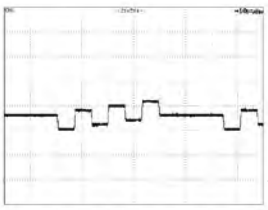
5 CN2301 Pin19 (C_OUT)
V: 0.5V/div. H: 10us/div.



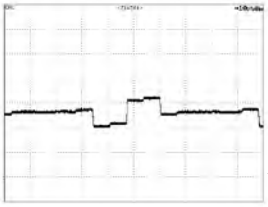
6 CN2301 Pin15 (YP_OUT)
V: 0.5V/div. H: 10us/div.



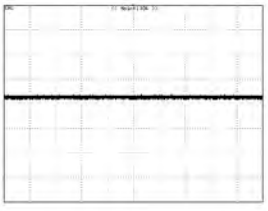
7 CN2301 Pin13 (CB_OUT)
V: 0.5V/div. H: 10us/div.



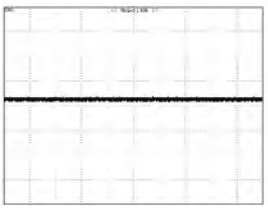
8 CN2301 Pin11 (CR_OUT)
V: 0.5V/div. H: 10us/div.



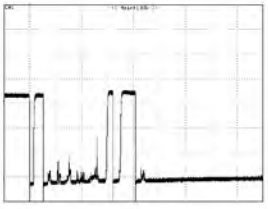
9 IC501 Pin22 (XDMUTE1)
V: 1V/div. H: 20us/div.



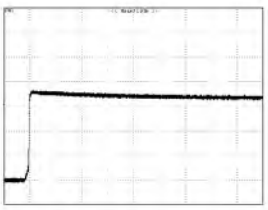
10 IC501 Pin23 (XDMUTE2)
V: 1V/div. H: 20us/div.



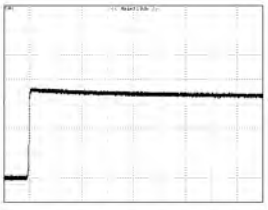
11 CN601 Pin3 (CLOSE)
open → close
V: 1V/div. H: 20us/div.



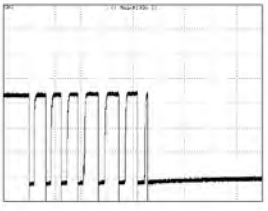
12 CN601 Pin3 (CLOSE)
close → open
V: 1V/div. H: 20us/div.



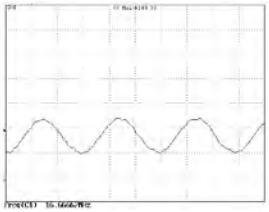
13 CN601 Pin5 (CLOSE)
open → close
V: 1V/div. H: 20us/div.



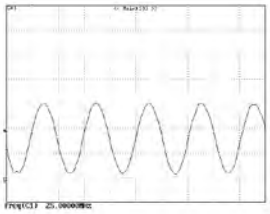
14 CN601 Pin5 (CLOSE)
close → open
V: 1V/div. H: 20us/div.



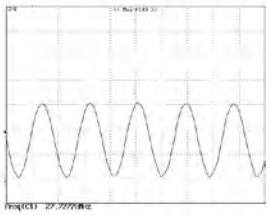
15 X201 (16.93MHz)
V: 1V/div. H: 20ns/div.



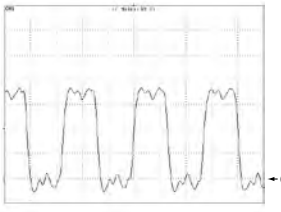
16 X1001 (24.576MHz)
V: 1V/div. H: 20ns/div.



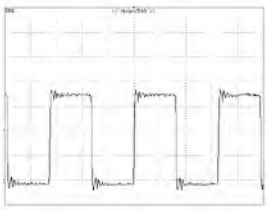
17 X1002 (27MHz)
V: 1V/div. H: 20ns/div.



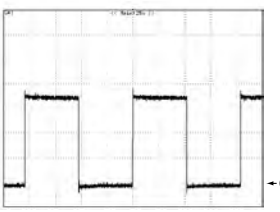
18 IC3101 Pin11 (ADCCLKO)
V: 1V/div. H: 20ns/div.



19 IC3101 Pin12 (AD_BCK)
V: 1V/div. H: 100ns/div.

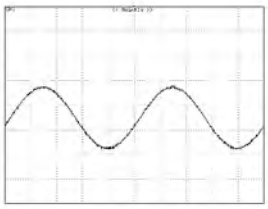


20 IC3101 Pin10 (AD_LRCK)
V: 1V/div. H: 5us/div.

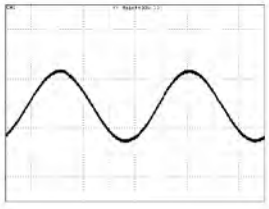


F MAIN ASSY

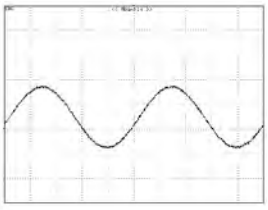
21 **CN2301 Pin4 (LCH IN)**
V: 1V/div. H: 200us/div.



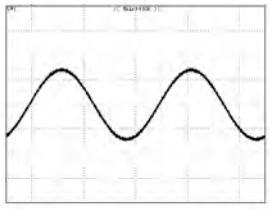
26 **CN2301 Pin21 (LCH OUT)**
V: 2V/div. H: 200us/div.



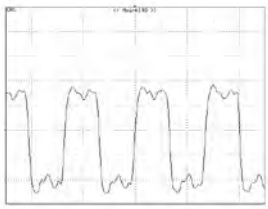
22 **CN2301 Pin2 (RCH IN)**
V: 1V/div. H: 200us/div.



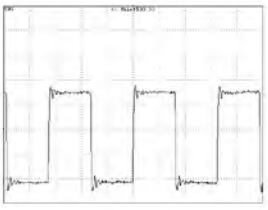
27 **CN2301 Pin23 (RCH OUT)**
V: 2V/div. H: 200us/div.



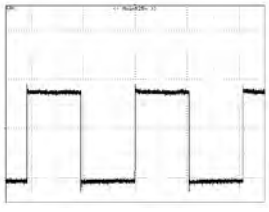
23 **IC3201 Pin16 (DACCLKO)**
V: 1V/div. H: 20ns/div.



24 **IC3201 Pin1 (DACBCKO)**
V: 1V/div. H: 100ns/div.



25 **IC3201 Pin3 (DACLRCKO)**
V: 0.5V/div. H: 5us/div.



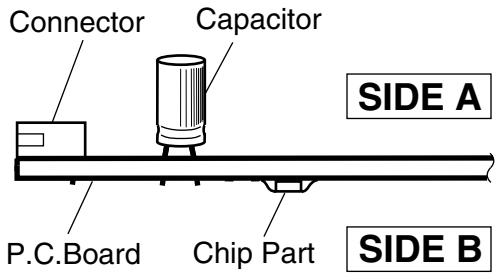
4. PCB CONNECTION DIAGRAM

NOTE FOR PCB DIAGRAMS :

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol In PCB Diagrams	Symbol In Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
		3-terminal regulator

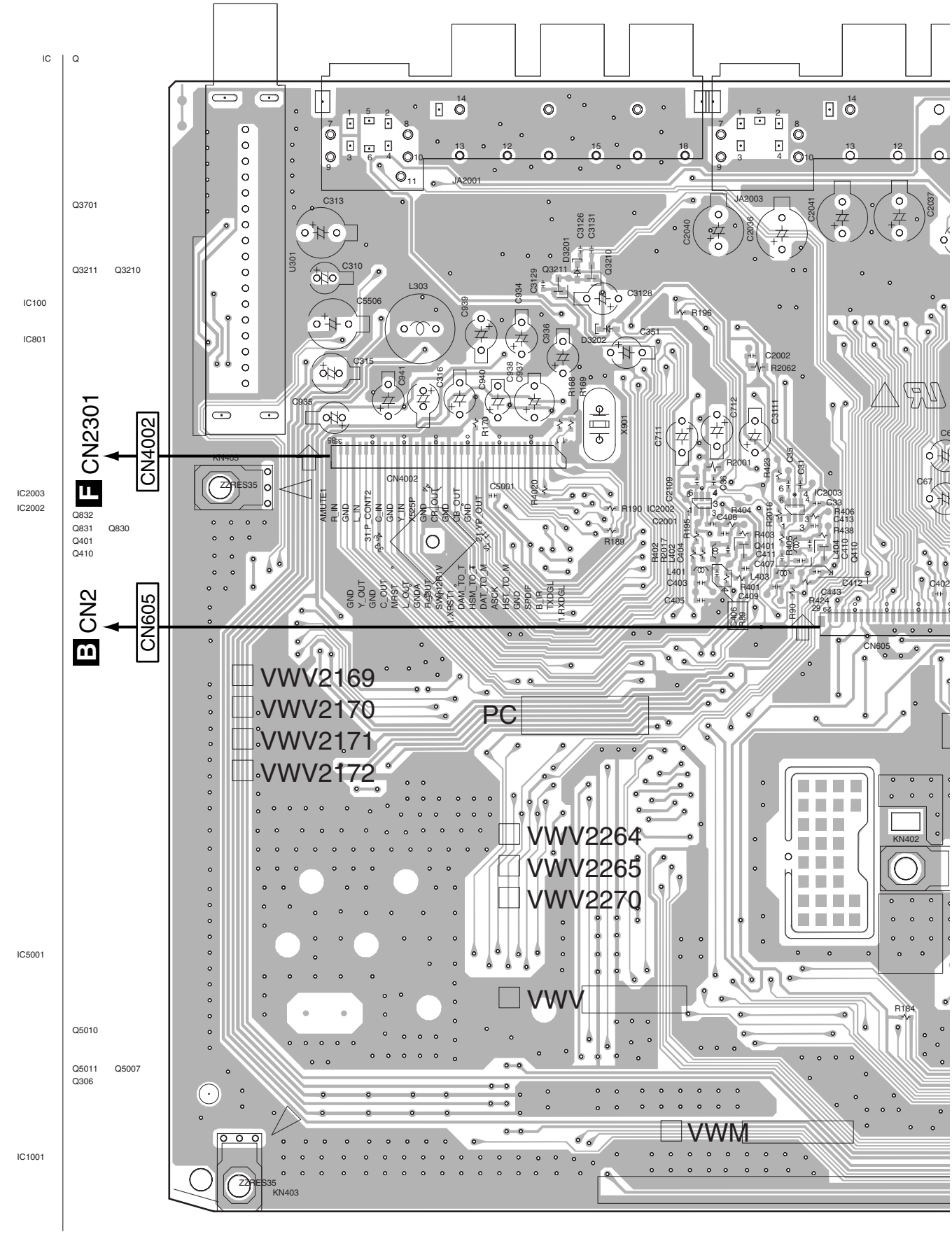
3. The parts mounted on this PCB include all necessary parts for several destinations.
   For further information for respective destinations, be sure to check with the schematic diagram.
4. View point of PCB diagrams.



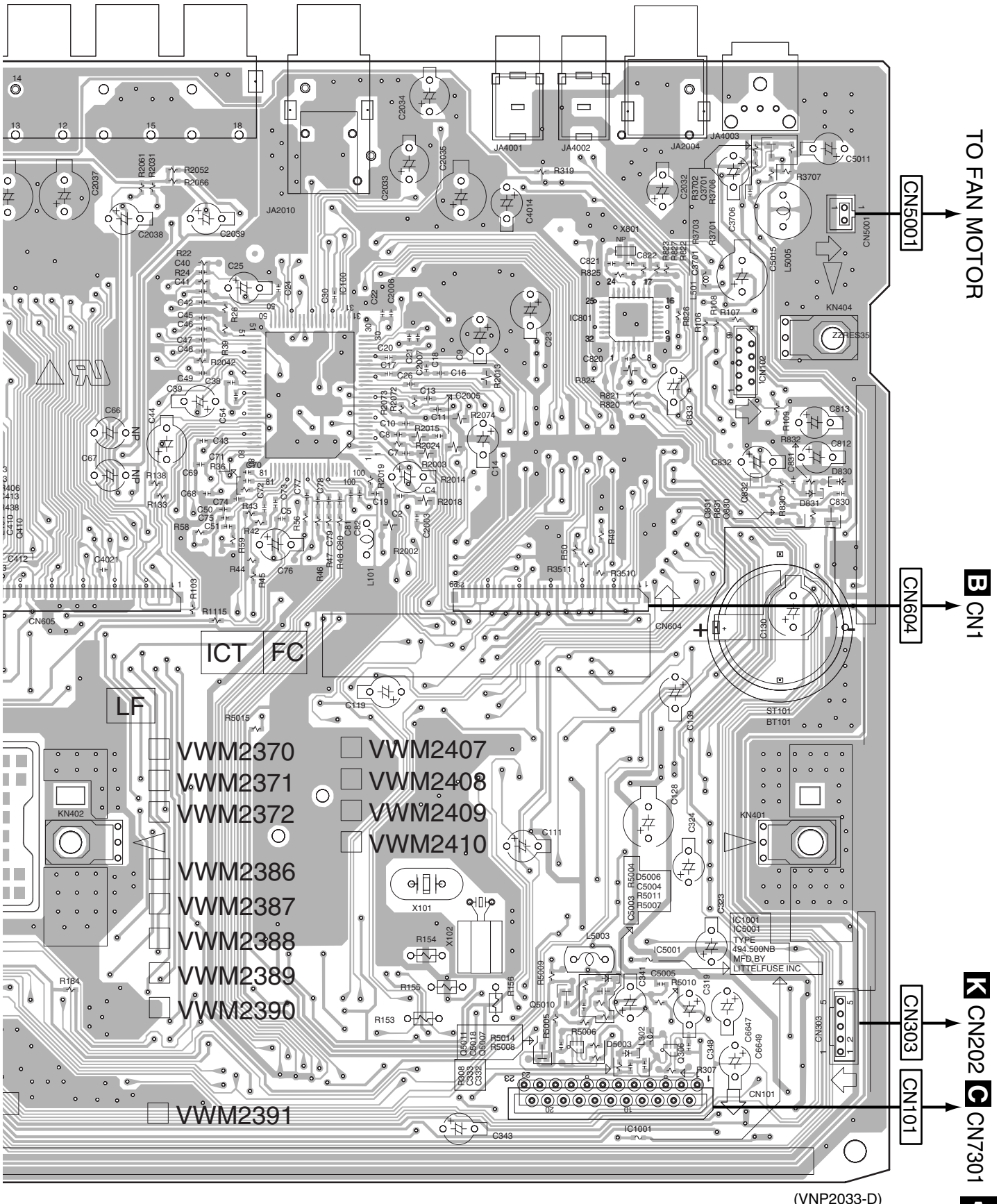
4.1 TUJB ASSY

SIDE A

A TUJB ASSY

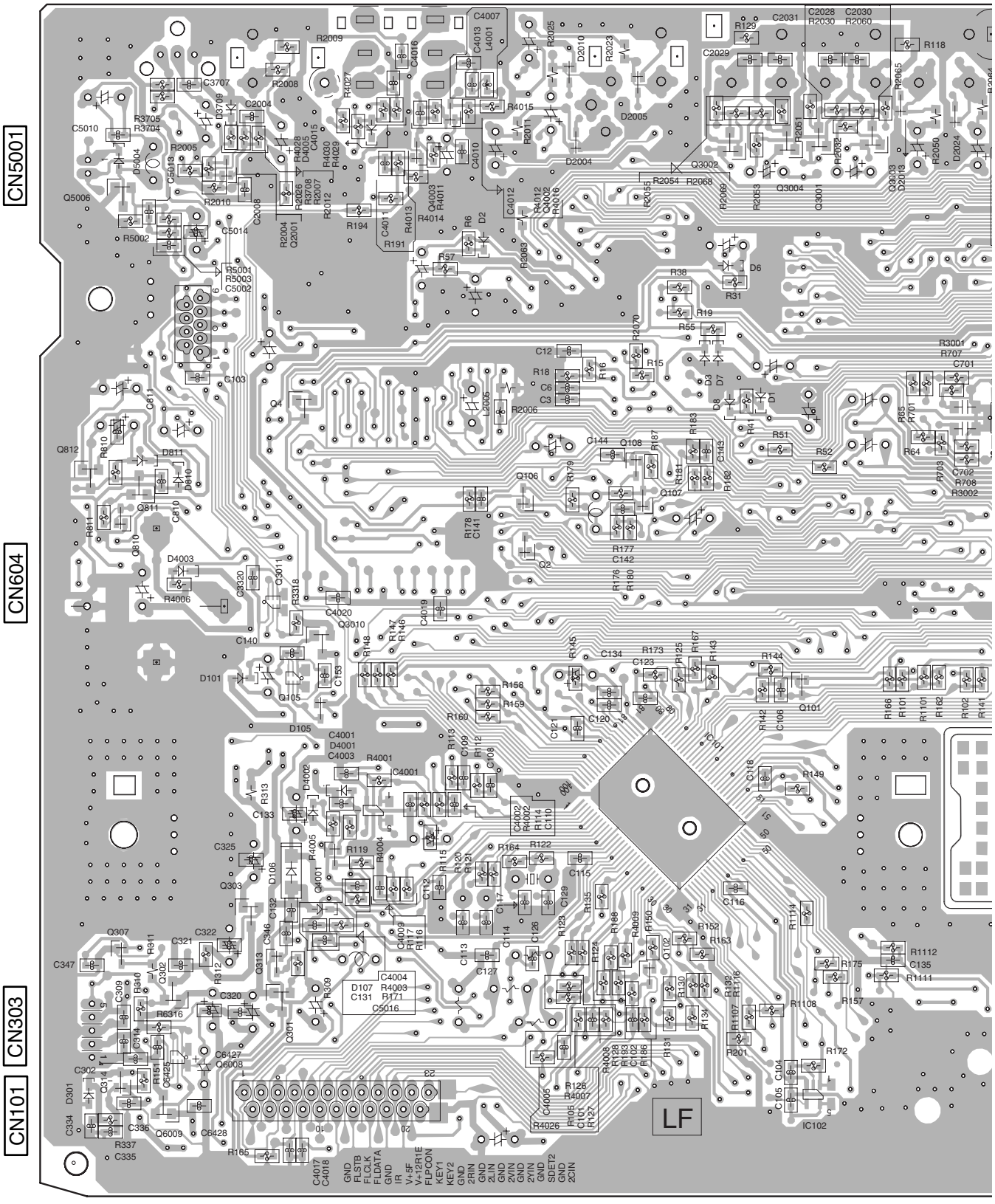


SIDE A

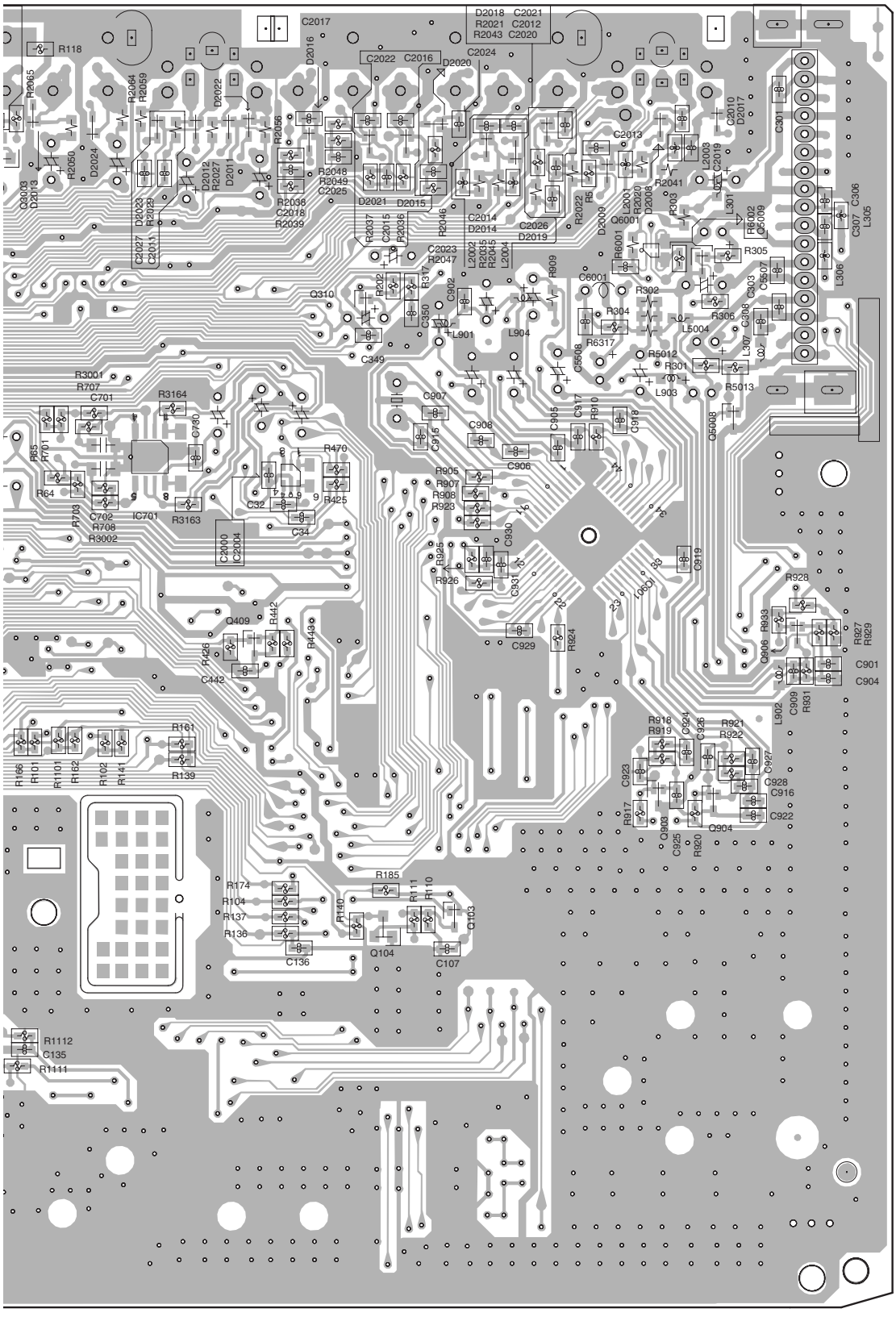

TO FAN MOTOR
CN5001
B CN1
CN604
K CN202 C CN7301
CN303
CN101
A
ICT FC
LF
VWM2370
VWM2371
VWM2372
VWM2386
VWM2387
VWM2388
VWM2389
VWM2390
VWM2391
VWM2407
VWM2408
VWM2409
VWM2410
(VNP2033-D)

SIDE B

A TUJB ASSY



SIDE B

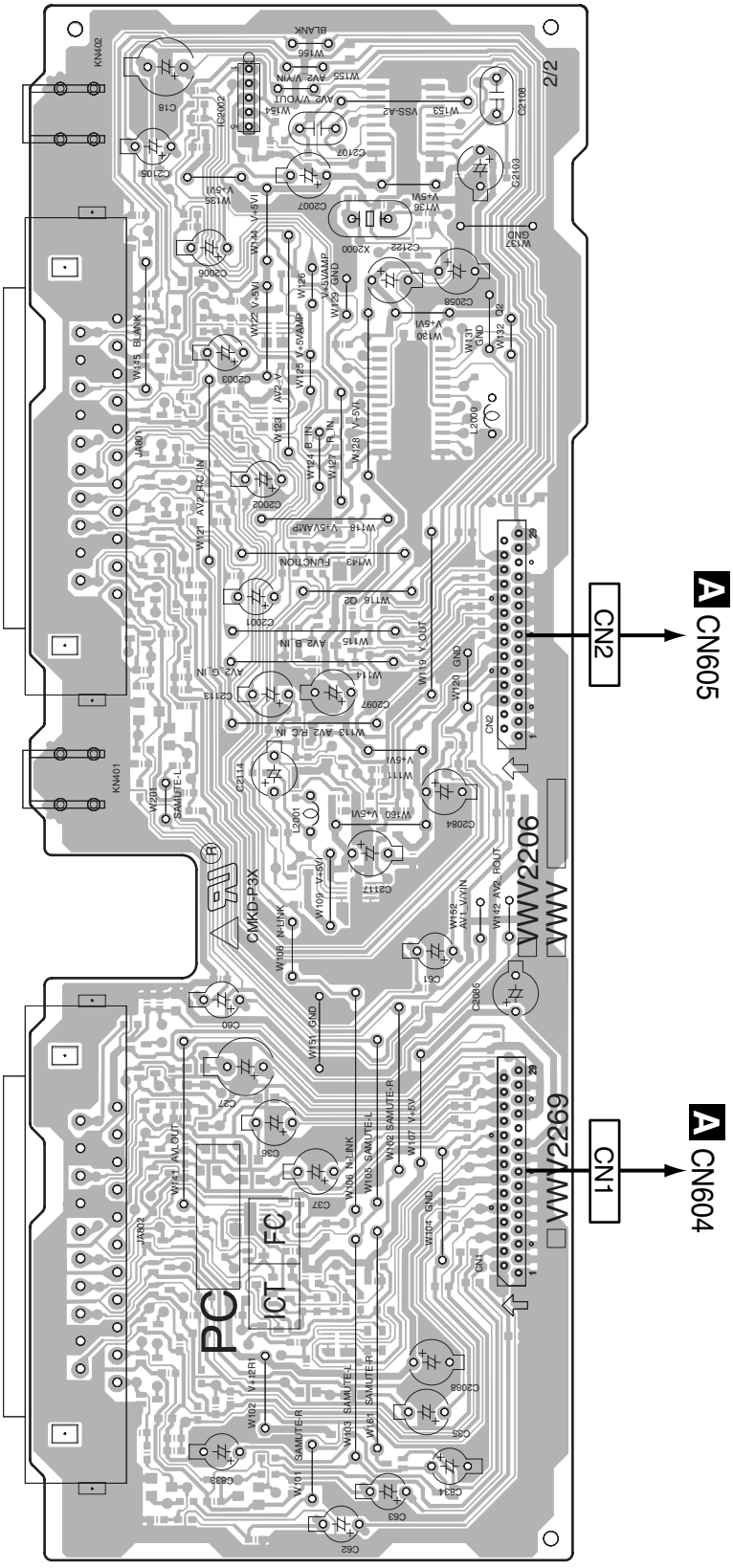


IC	Q
	Q3002
	Q5006 Q3004 Q3003 Q4003 Q4002 Q3001 Q6001 Q5009
	Q2001
	Q310
	Q4 Q5008
	Q812 Q108
IC701	Q106 Q107 Q811
IC2004 IC901	
	Q810 Q2 Q409 Q3011
	Q906 Q3010
	Q105 Q101
IC101	
	Q904
IC4001	Q903
	Q103
	Q104 Q303 Q4001
	Q307
	Q102 Q313 Q302
	Q301
	Q6008
	Q314
IC102	Q6009

4.2 SCRB ASSY

SIDE A

B SCRB ASSY

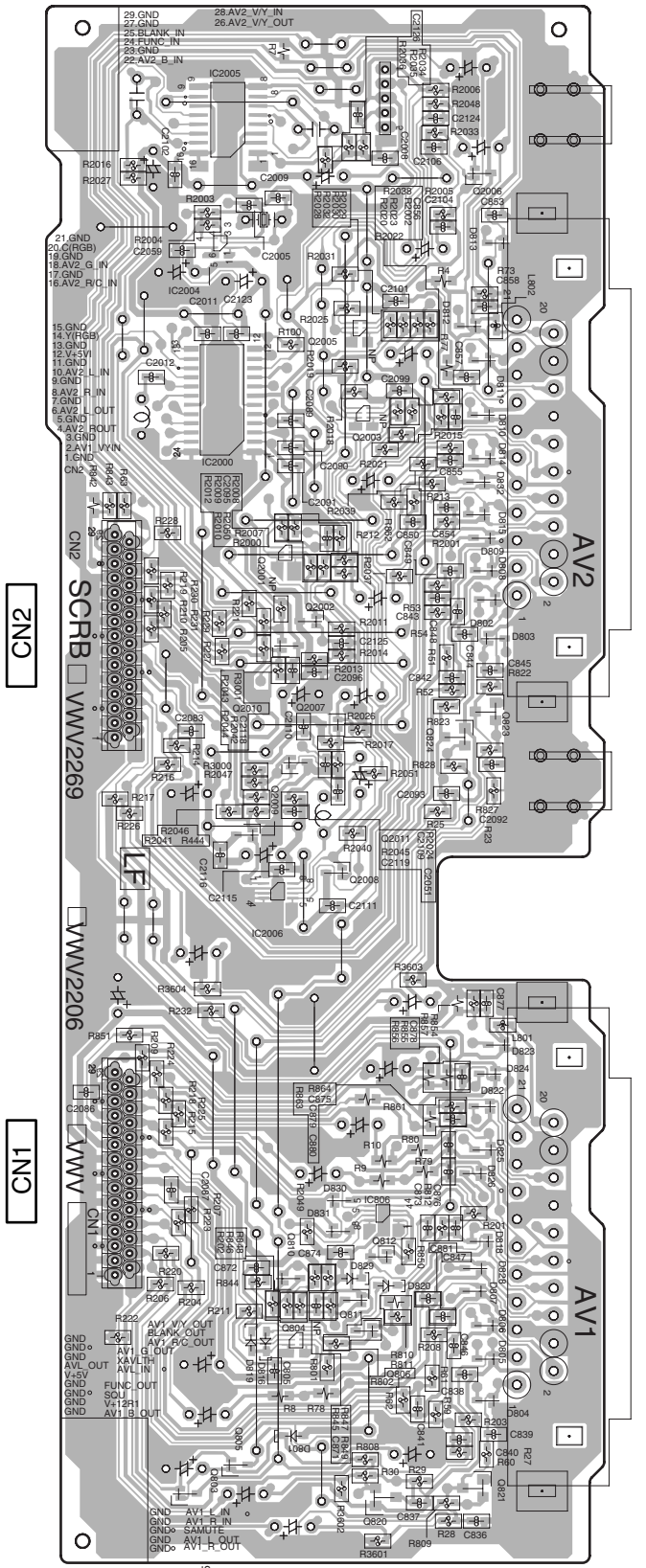


IC IC2002

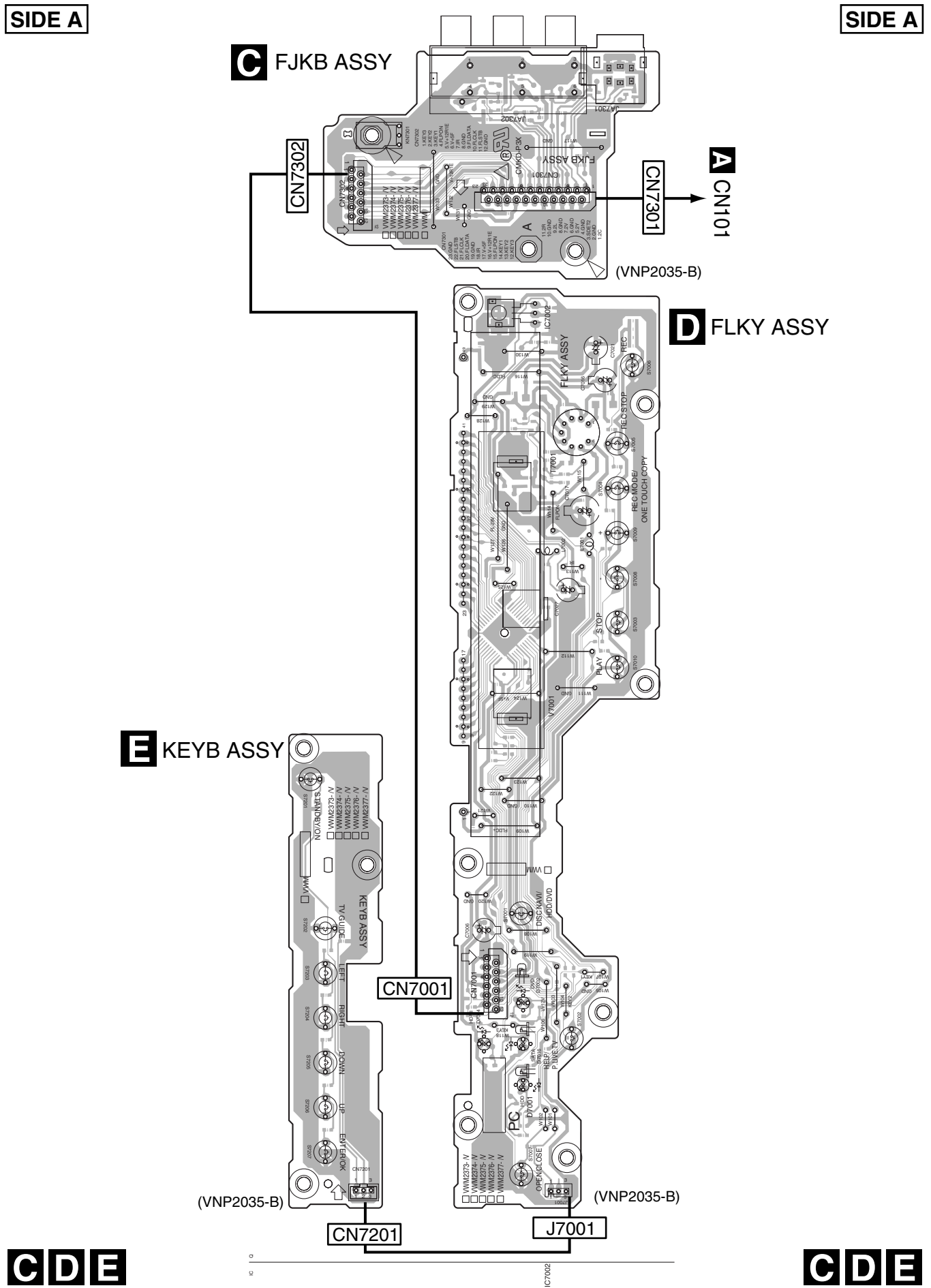
B **B**

SIDE B

B SCRB ASSY



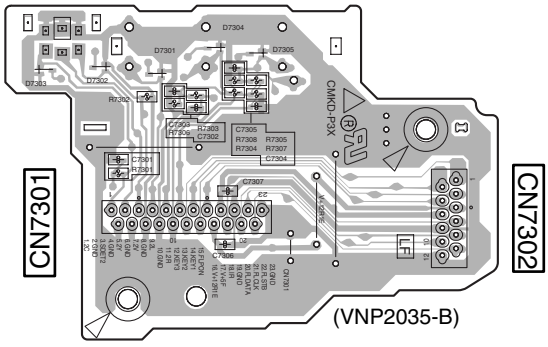
4.3 FJKB, FLKY and KEYB ASSYS



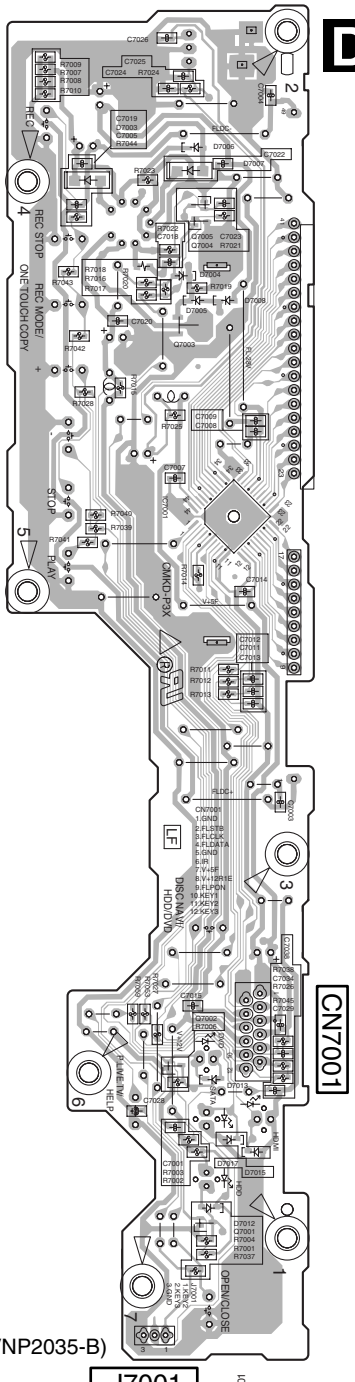
SIDE B

SIDE B

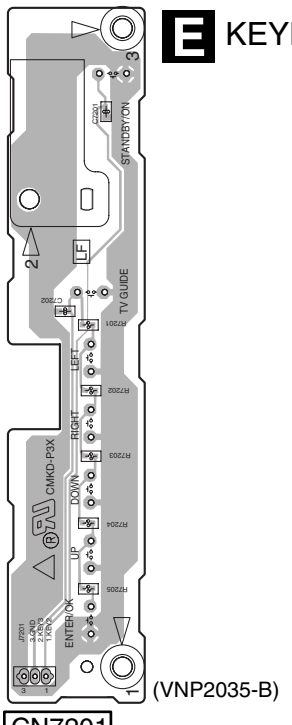
C FJKB ASSY



D FLKY ASSY



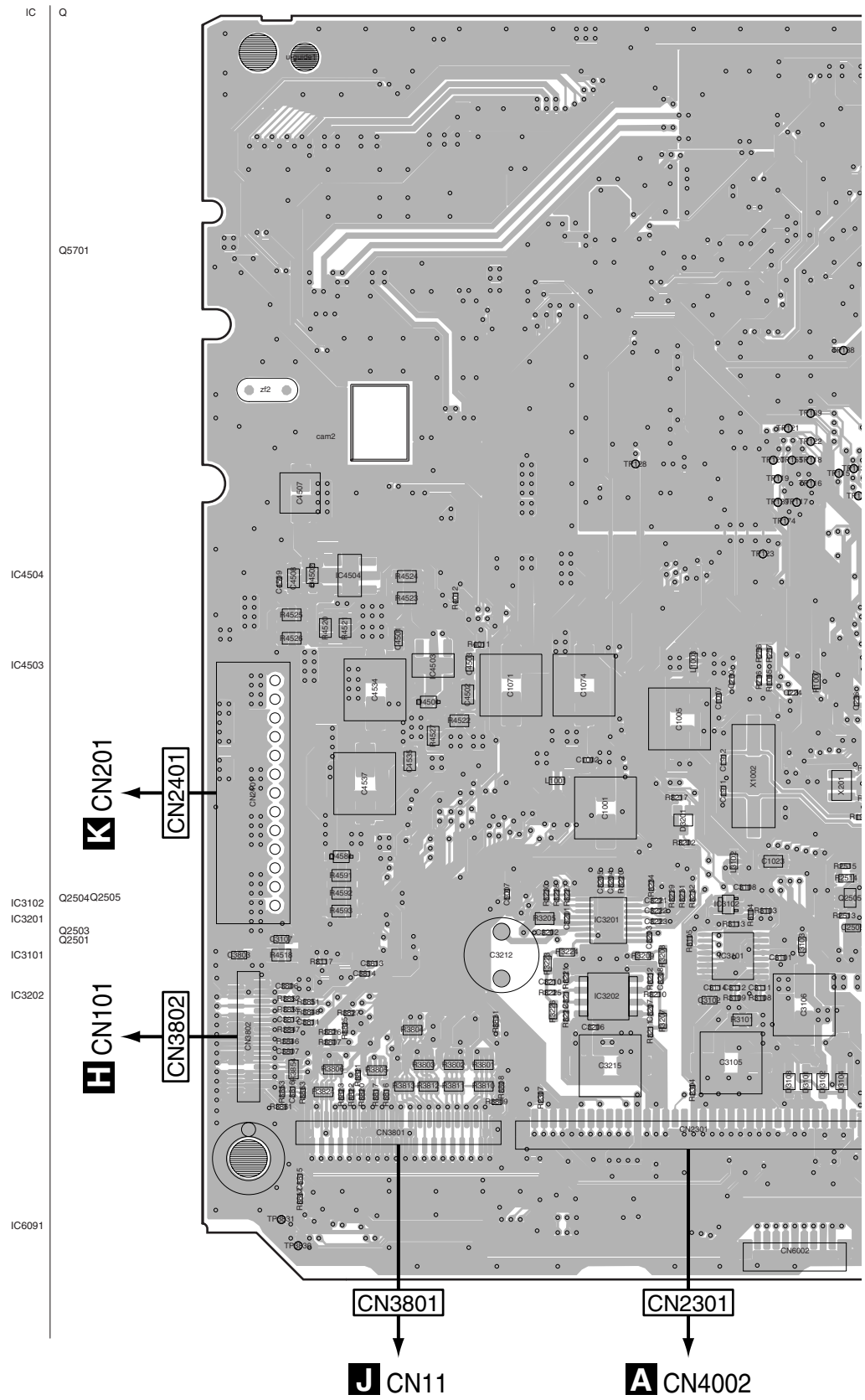
E KEYB ASSY



4.4 MAIN ASSY

SIDE A

F MAIN ASSY



SIDE A

A

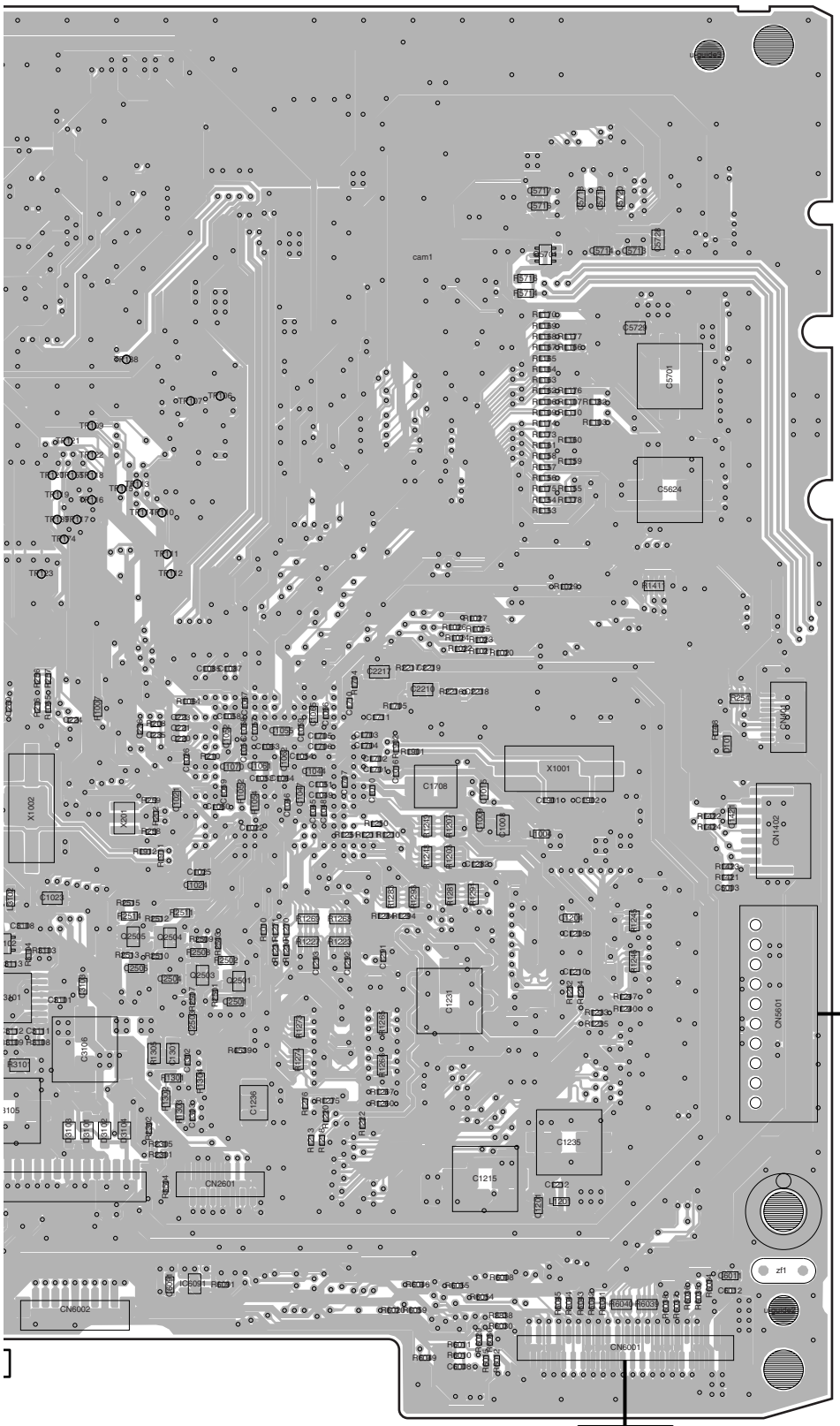
B

C

D

E

F



I CN101

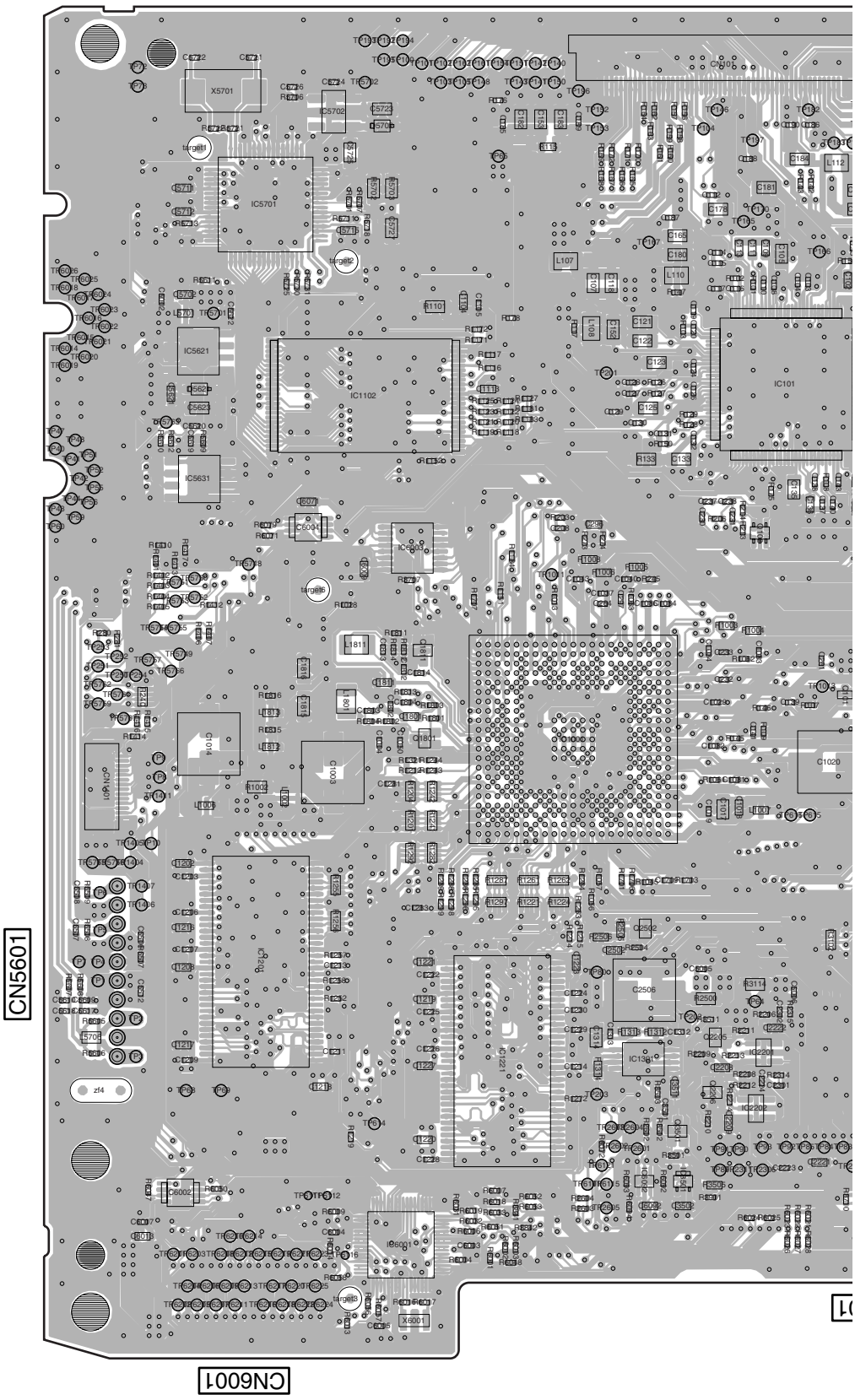
CN5601

CN6001 (VNP2052-A)

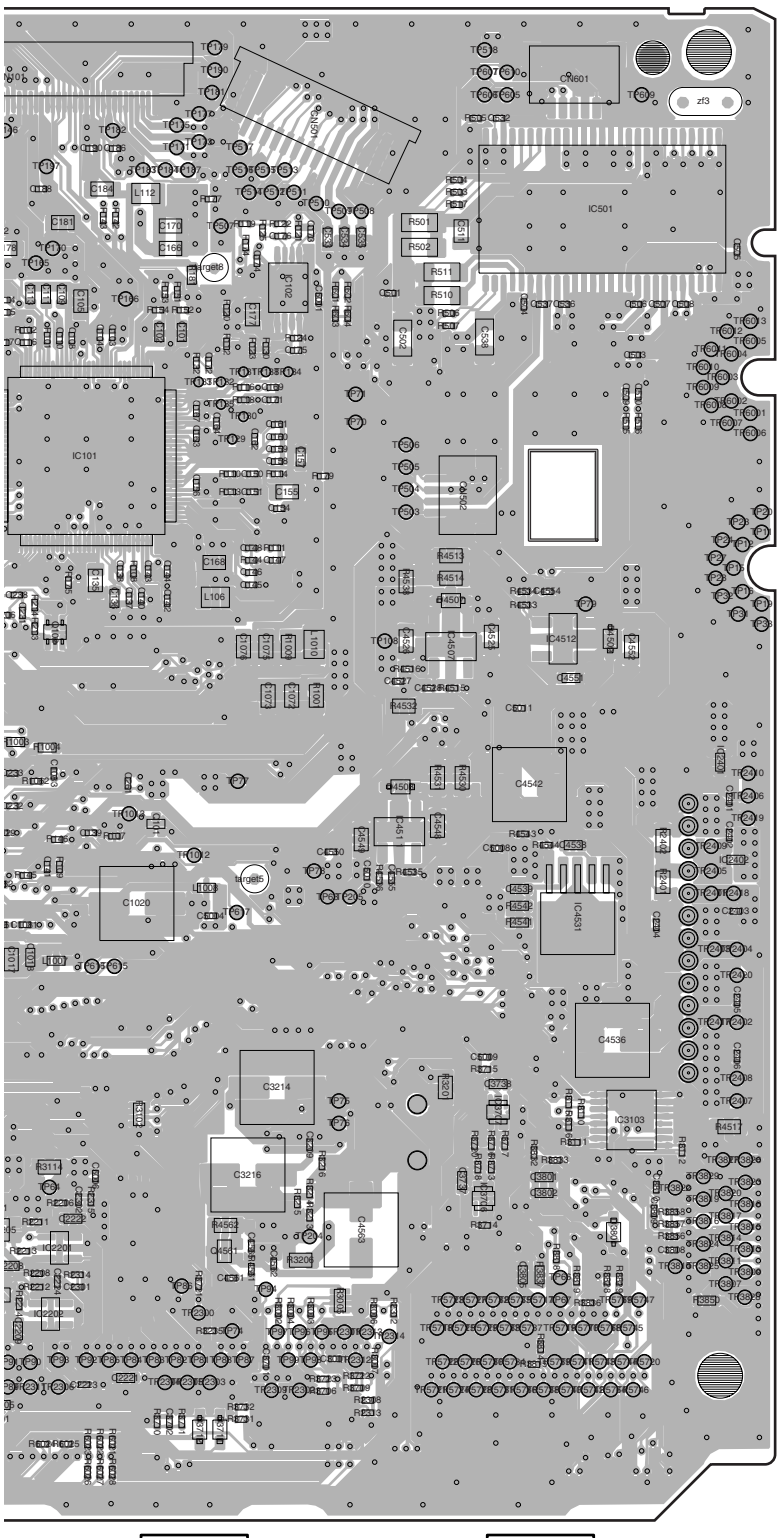
G CN101

SIDE B

F MAIN ASSY



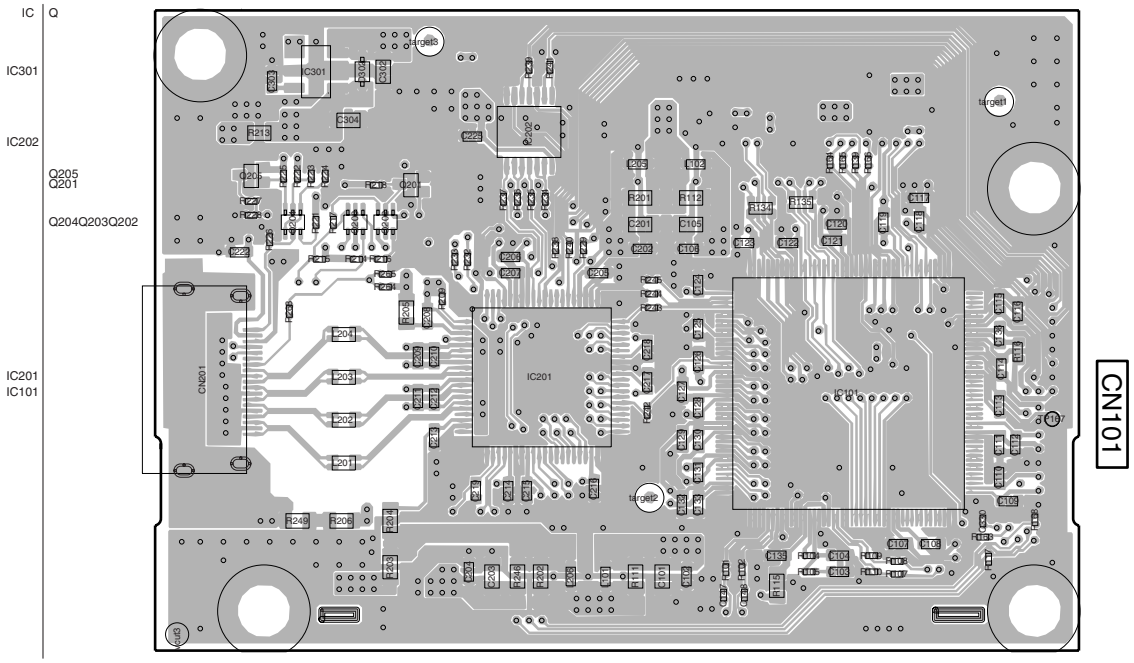
SIDE B


CN2301
CN3801
(VNP2052-A)
CN2401
CN3802
IC Q
IC5702
IC501
IC5701
IC102
IC5621
IC101
IC1102
IC5631
IC6004
IC4512
IC6003
IC4507
Q102
IC2401
Q1811
IC451
Q101
IC2402
IC1001
Q1801
IC4531
Q2502
IC3707
IC3103
IC1201
IC3706
Q2205
IC2201
IC1221
IC1301
Q4561
Q2206
IC2202
Q3501
IC6092
IC3501
IC6002
IC6001

4.5 HDMIB ASSY

SIDE A

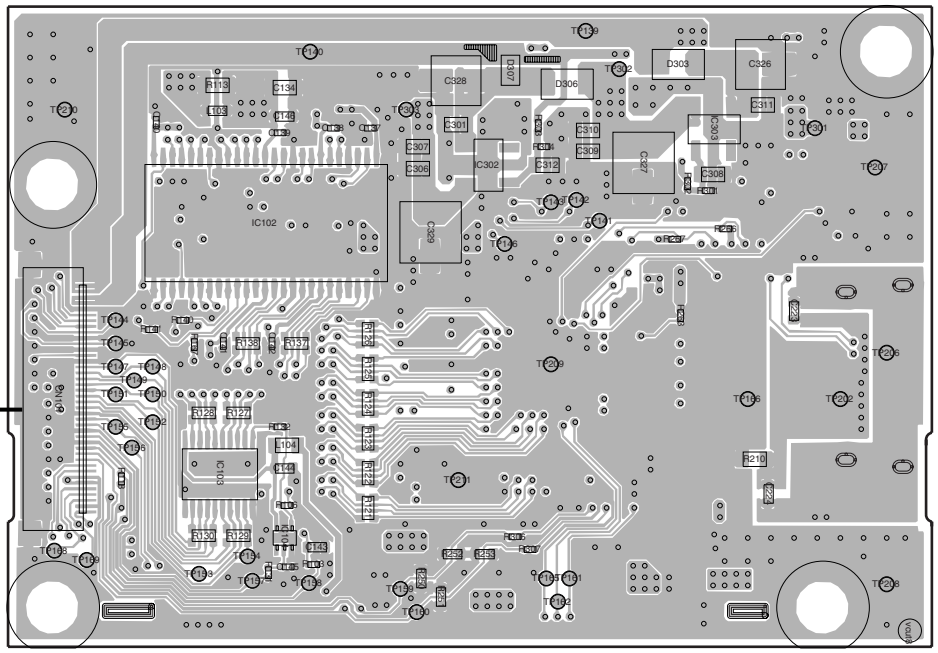
G HDMIB ASSY



(VNP2050-A)

SIDE B

G HDMIB ASSY



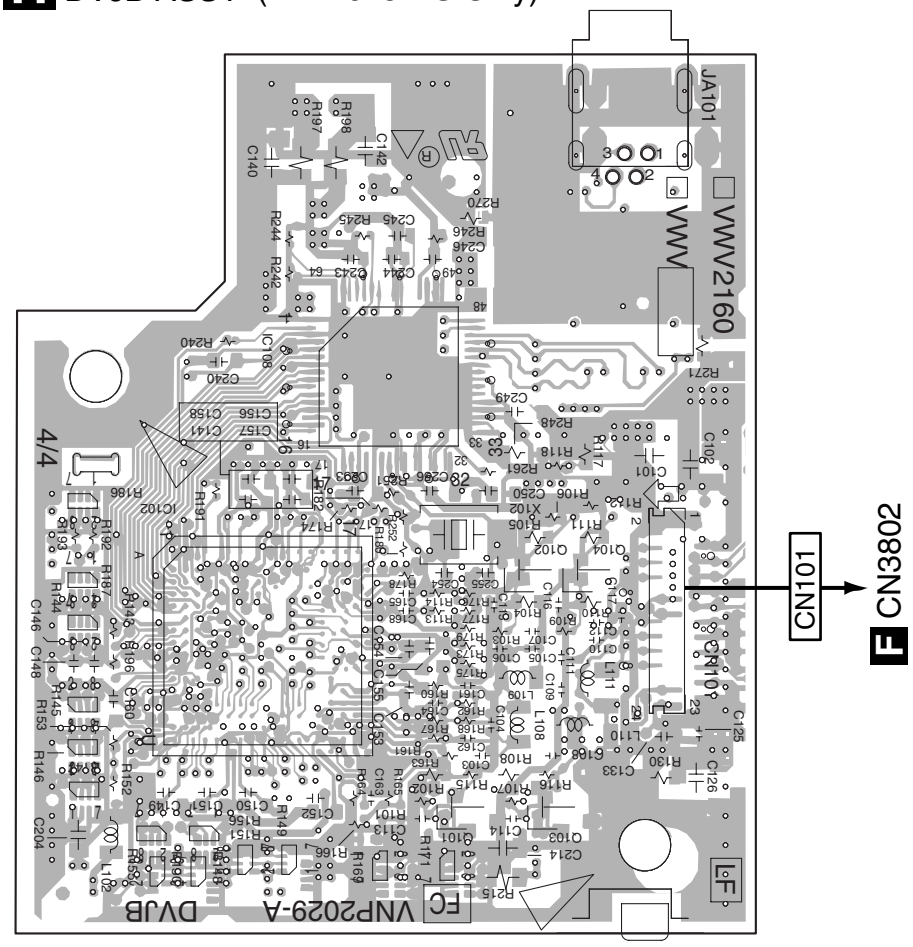
F CN6001

4.6 DVJB ASSY (DVR-645H-S Only)

SIDE A

SIDE A

H DVJB ASSY (DVR-645H-S Only)



IC | Q

IC108

IC102

Q102 Q104

Q101 Q103

H

SIDE B

SIDE B

A

B

C

D

E

F

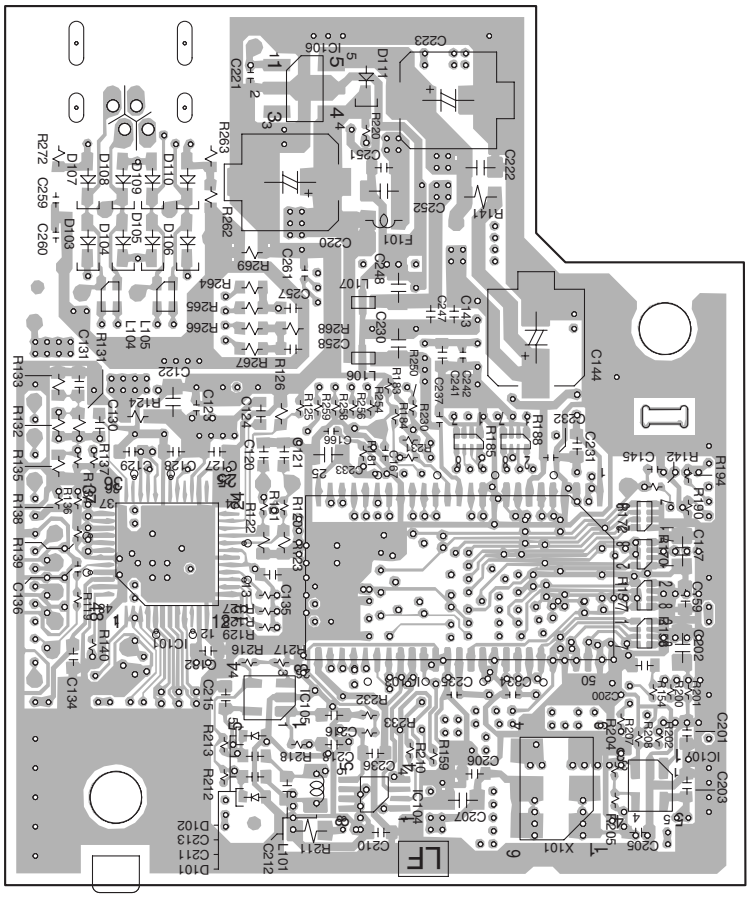
H DVJB ASSY (DVR-645H-S Only)

IC Q

IC106

IC101
IC103
IC105

IC107
IC104



(VNP2029-A)

4.7 USBB ASSY (DVR-645H-S Only)

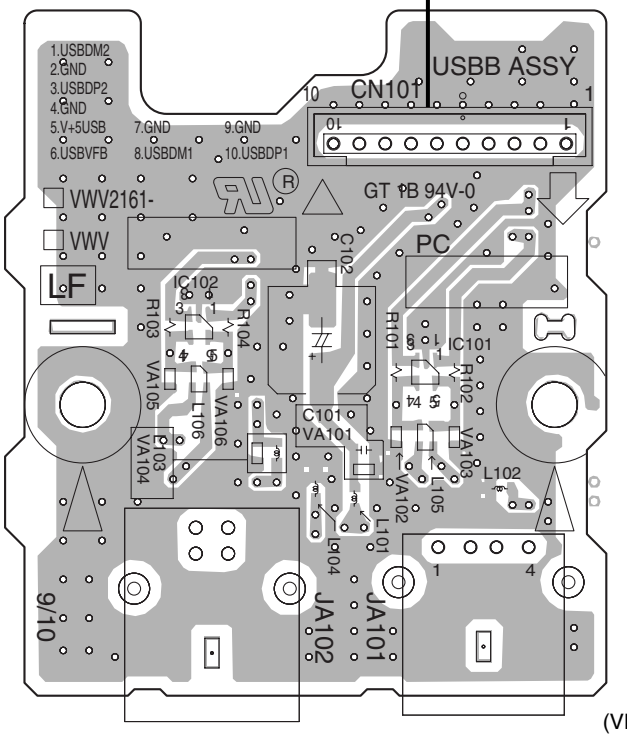
SIDE A

SIDE A

(DVR-645H-S Only)

F CN5601

I USBB ASSY



(VNP2030-A)

I

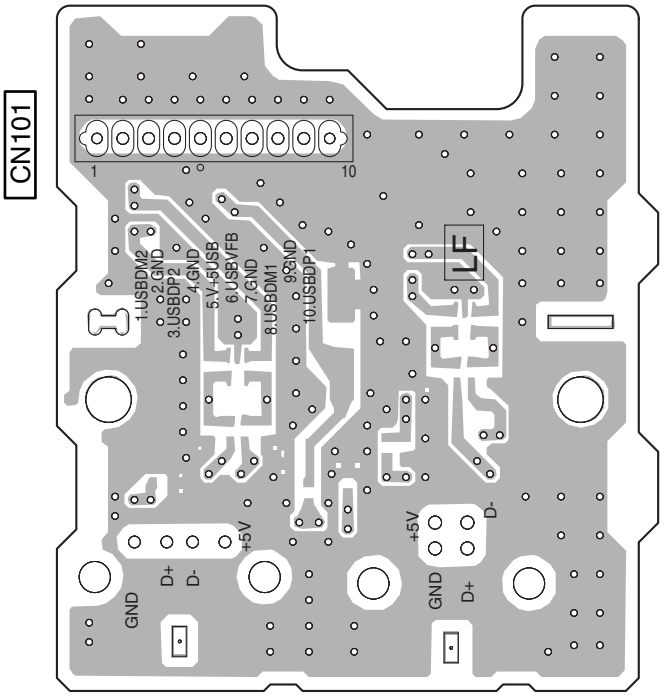
I

SIDE B

SIDE B

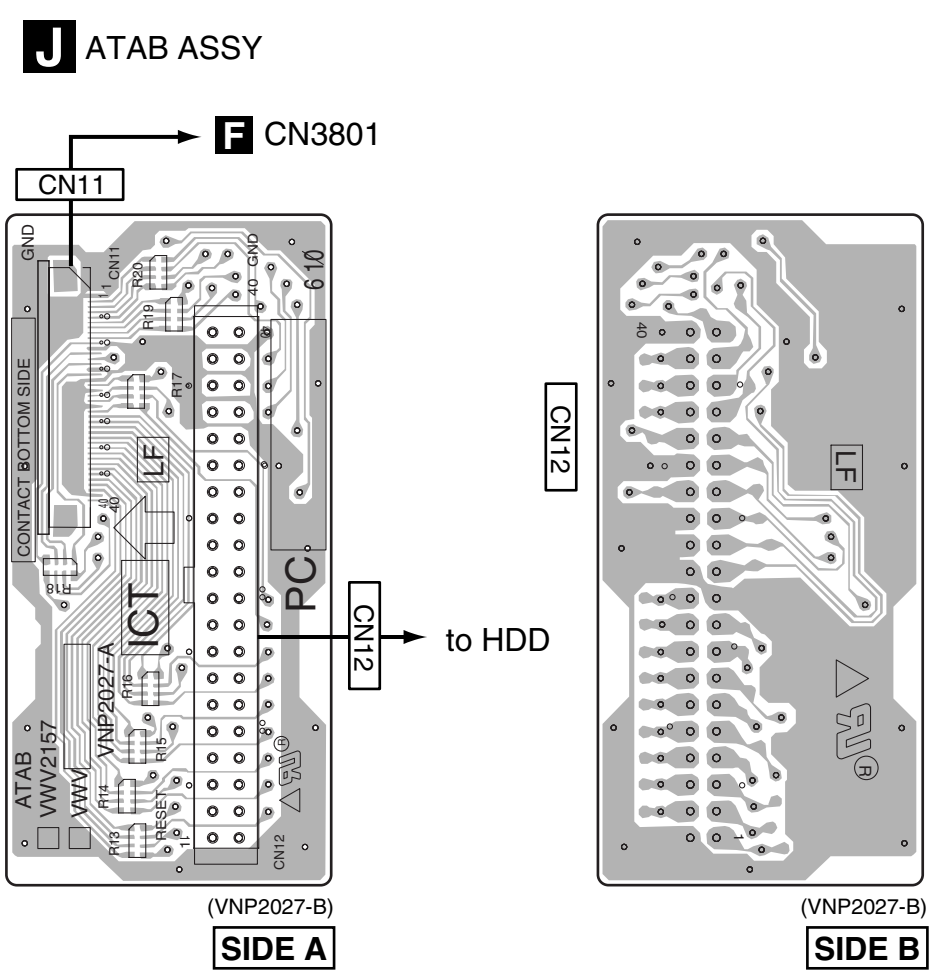
A B C D E F

USBB ASSY (DVR-645H-S Only)



(VNP2030-A)

4.8 ATAB ASSY


SIDE A
J ATAB ASSY
SIDE B
F CN3801
CN11
GND
CONTACT BOTTOM SIDE
LF
ICT
PC
CN12
to HDD
ATAB
VWV2157
VNP2027-A
RESET
CN12
(VNP2027-B)
SIDE A
CN12
LF
(VNP2027-B)
SIDE B

A

B

C

D

E

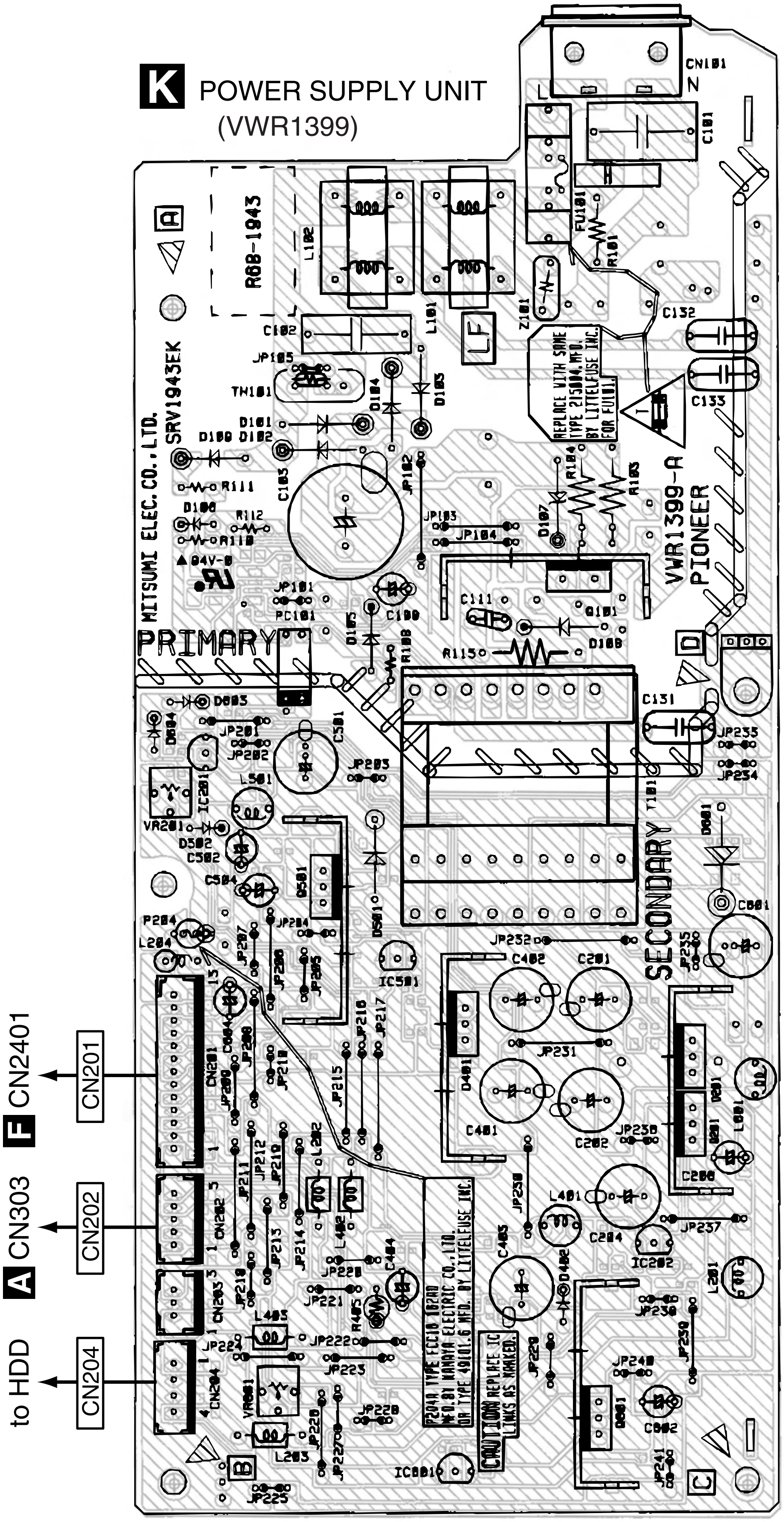
F

4.9 POWER SUPPLY UNIT

SIDE A

SIDE A

K POWER SUPPLY UNIT
(VWR1399)

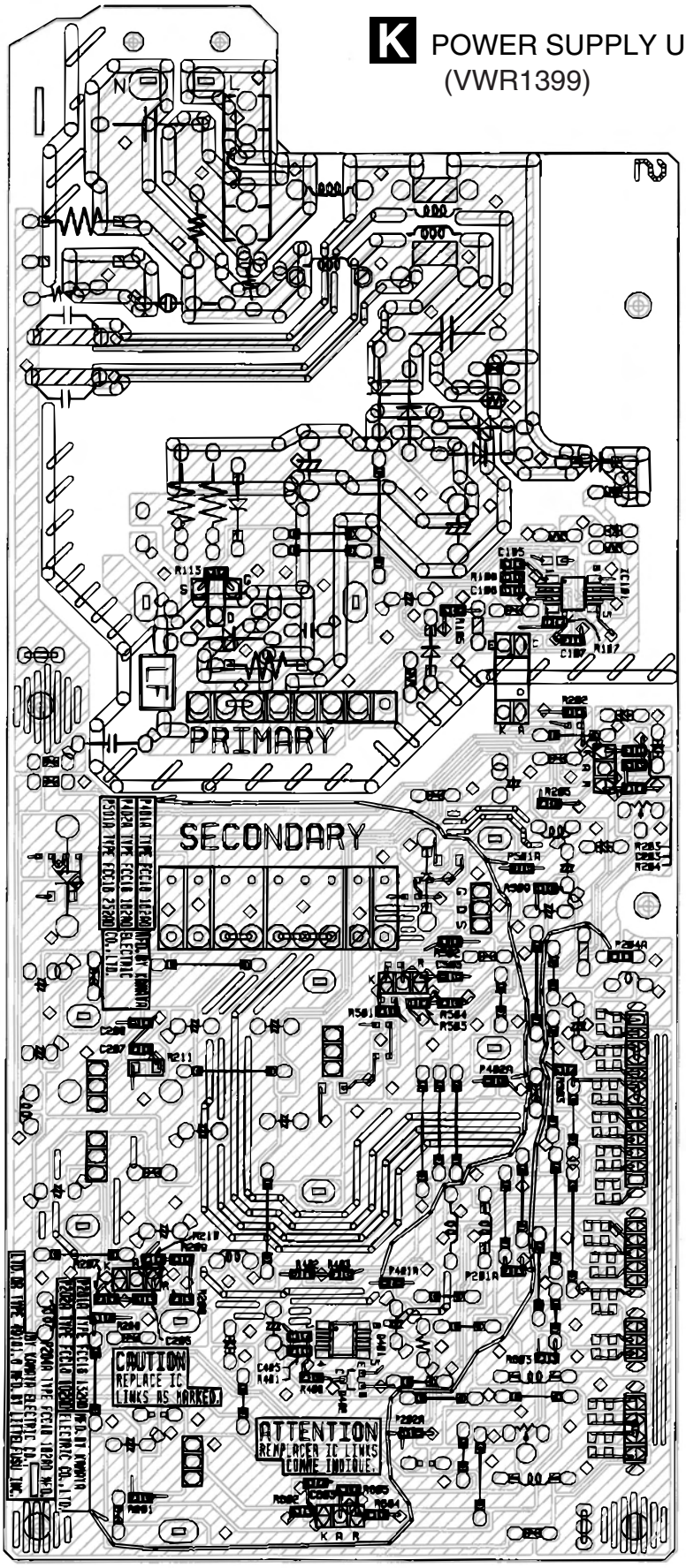


CN101
L
N
C101
FU101
R101
Z101
L102
L101
RGB-1943
C102
JP105
TH101
D104
D105
D101
D100 D102
C132
C133
REPLACE WITH SAME TYPE 215004.MFD. BY LITTELFUSE INC. FOR FU101.
SRV1943EK
MITSUMI ELEC.CO.,LTD.
R111
D106
R112
R110
94V-0
C103
JP102
JP103
JP104
R104
R105
D107
VWR1399-A
PIONEER
JP101
PC101
C109
D195
R108
C111
Q101
D108
R115
PRIMARY
C131
JP235
JP234
T101
D801
C801
D803
D804
JP201
JP202
C501
JP203
L501
IC201
VR201
D502
C502
C504
Q501
D501
P204
L204
JP207
JP204
JP206
JP205
IC501
JP232
C402
C201
SECONDARY
D401
JP216
JP217
JP231
C401
C202
JP230
D201
L801
C200
CN201
C804
JP208
JP209
JP210
JP215
JP211
JP212
JP219
L202
CN202
JP213
JP214
L402
JP220
C404
C405
L401
C204
JP237
IC202
L201
JP238
CN203
JP218
JP221
R405
D402
JP239
JP222
L403
JP224
JP223
JP229
JP240
JP250
CN204
VR801
JP228
JP226
JP227
L203
IC801
D801
C802
JP241
JP225
P204A TYPE FCC10 1B2A0 MFD.BY NANAYA ELECTRIC CO.,LTD. OR TYPE 49101.6 MFD. BY LITTELFUSE INC.
CAUTION REPLACE IC LINKS AS MARKED.
CN2401
CN303
to HDD

SIDE B

SIDE B

K POWER SUPPLY UNIT (VWR1399)



5. PCB PARTS LIST

NOTES: ● *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*

● *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

● *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω → 56 x 10[1] → 561 ..... RD1/4PU 5 6 1 J
47k Ω → 47 x 10[3] → 473 ..... RD1/4PU 4 7 3 J
0.5 Ω → R50 ..... RN2H R 5 0 K
1 Ω → 1R0 ..... RS1P 1 R 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 x 10[1] → 5621 ..... RN1/4PC 5 6 2 1 F

LIST OF WHOLE PCB ASSEMBLIES

Mark	Symbol and Description	DVR-645H-S	DVR-545H-S
NSP	1..TUJB ASSY	VWM2408	VWM2407
NSP	2..TUJB	VWV2264	VWV2264
	3..TUJB ASSY (for Service)	VXX3183	VXX3182
	1..SCRB ASSY	VWV2269	VWV2269
NSP	1..FLKB ASSY	VWM2420	VWM2420
NSP	2..FLKB ASSY	VWG2594	VWG2594
	3..FLKY ASSY (for Service)	VXX3180	VXX3180
	3..KEYB ASSY (for Service)	VXX3112	VXX3112
	3..FJKB ASSY (for Service)	VXX3113	VXX3113
	1..MAIN ASSY (for Service)	VXX3176	VXX3175
	1..HDMIB ASSY	VWV2247	VWV2247
	1..DVJB ASSY	VWV2160	Not used
	1..USBB ASSY	VWV2161	Not used
	1..ATAB ASSY (for Service)	VXX3140	VXX3140
⚠	1..POWER SUPPLY UNIT	VWR1399	VWR1399

A TUJB ASSY

VXX3183 and VXX3182 are constructed the same except for the following :

Mark	Symbol and Description	VXX3183	VXX3182
	R153	Not used	RD1/4PU393J
	R154	RD1/4PU153J	RD1/4PU682J

Mark	No.	Description	Part No.

A TUJB ASSY

SEMICONDUCTORS

	IC0701	BA4560RF
	IC4001	BD4846G
	IC0102	BU4220G
⚠	IC1001, IC5001	CEK1278
	IC0100	HA118326APFR
	IC2003	MM1501XN
	IC2002, IC2004	MM1503XN
	IC0901	MSP3417G
	IC0101	PMC014A8
⚠	Q0301, Q0302, Q0811	2SA1036K
	Q0401, Q0410, Q0903, Q0904, Q4002	2SA1576A
	Q5008, Q5009	2SA1576A
	Q0303, Q0812, Q6009	2SC2411K
	Q0102, Q0107, Q0108, Q0409, Q0906	2SC4081
	Q4003, Q5011	2SC4081
	Q5010	2SC5876
	Q0004, Q3001, Q3002, Q3010, Q5006	2SD2114K
	Q3210	DTA124EUA
	Q0106	DTA143EUA
	Q0101	DTC114TUA
	Q0002, Q0307, Q0313, Q0810, Q3211	DTC124EUA
	Q4001	DTC124EUA
	Q5007	HN1A01FU
	Q6008	RN4903
	Q0105, Q3011	UMD2N
	Q6001	UMF21N
	Q0306	UMF23N
	D0106	1SR154-400
	D0101, D0107, D0811, D3201, D3202	1SS355
	D4001, D4002, D4005, D5004, D5006	1SS355
	D0105	DAP202U
	D0001	UDZS11(B)

Mark No.	Description	Part No.
D0301		UDZS15(B)
D0002		UDZS6R8(B)
D0810		UDZS9R1(B)
D2008, D2009, D2011, D2012		UMZ6R8N

COILS AND FILTERS

L5005	ATH1109
L0305, L0306	CTF1306
L2002, L2005	CTF1388
L0301, L0302, L0901, L0904, L5004	CTF1399
L0101	LAU470J
L0902	LCYA100J2520
L0903	LCYA101J2520
L0501	LCYA120J2520
L0401, L0403	LCYA150J2520
L0402, L0404	LCYA180J2520
L5003	LRCA331J

CAPACITORS

C0113, C0114, C0141	CCSRCH100D50
C0068, C0069, C0909, C4011, C4012	CCSRCH101J50
C0117, C0129	CCSRCH120J50
C0306, C0307, C0405, C0411	CCSRCH330J50
C4009	CCSRCH331J50
C2016, C2017, C2028, C2029, C5013	CCSRCH471J50
C0906, C0908	CCSRCH560J50
C0925, C0928	CCSRCH561J50
C0408, C0413	CCSRCH680J50
C0404, C0410	CCSRCH7R0D50
C0406, C0412	CCSRCH820J50
C0403, C0409, C0907, C0915	CCSRCJ3R0C50
C0937	CEAL100M50
C0938	CEAL3R3M50
C0066, C0067	CEANP4R7M50
C0014, C0310, C0341, C0939	CEAT100M50
C0023, C0025, C0039, C0044, C0139	CEAT101M10
C0812, C0813, C6649	CEAT101M10
C0319, C0323, C3111	CEAT101M16
C0130, C0313, C2035-C2037, C5506	CEAT102M6R3
C0004, C2032	CEAT1R0M50
C0111	CEAT220M25
C3128	CEAT221M6R3
C0119	CEAT2R2M50
C2038, C2039, C5015	CEAT470M16
C0128, C2033, C2034	CEAT471M6R3
C0076	CEAT4R7M50
C0711, C0712	CEJQ100M16
C5004	CKSQYF105Z50
C0901, C0923, C0926, C2005	CKSRYB103K50
C2011, C2012	CKSRYB103K50
C0008, C0012, C0017, C0020	CKSRYB104K16
C0030, C0031, C0035, C0049, C0054	CKSRYB104K16
C0105, C0905, C0919, C6428	CKSRYB104K16
C0002, C0007, C0010, C0011, C0013	CKSRYB105K10
C0016, C0019, C0026, C0032, C0034	CKSRYB105K10
C0036, C0040-C0042, C0045-C0048	CKSRYB105K10
C0050, C0051, C0072, C0073	CKSRYB105K10
C0077-C0082, C2109, C4003	CKSRYB105K10
C0301, C5507	CKSRYB222K50
C0924, C0927	CKSRYB392K50
C0003, C0006, C0021, C0022, C0024	CKSRYF104Z25
C0038, C0070, C0071, C0101, C0102	CKSRYF104Z25
C0104, C0115, C0135, C0136, C0407	CKSRYF104Z25
C0443, C0730, C0810, C0811	CKSRYF104Z25
C0917, C0918, C4001, C4002, C4004	CKSRYF104Z25
C4016, C5005, C5010, C5014	CKSRYF104Z25
C0005, C0043, C0142, C0144, C0929	CKSRYF105Z10
C0701, C0702	CKSYB106K10

RESISTORS

R0156	RD1/4PU153J
R0155	RD1/4PU393J
R0701, R0703	RN1/16SE1002D
R0707, R0708	RN1/16SE8201D
R0313, R0909	RS1/10S0R0J
R0302, R0304	RS1/10S100J
R0303, R5012	RS1/10S120J
R0311	RS1/10S471J
R2003, R2006, R2011, R2015, R2020	RS1/10S75R0F
R2022, R2023, R2025, R2027, R2029	RS1/10S75R0F
R2035, R2050	RS1/10S75R0F
R0195	RS1/16S1000F
R5007	RS1/16S1003F
R5006	RS1/16S2202F
R0402	RS1/16S2700F
R2070	RS1/16S3304F
R0405	RS1/16S4300F
R0177	RS1/16S7500F
Other Resistors	RS1/16S###J

OTHERS

X0101 CRYSTAL OSC	CSS1653
X0102 (32KHZ)	VSS1197
X0901 (18.432MHZ)	VSS1189
CN0604, CN0605 29P CONNECTOR	VKN1433
CN4002 35P CONNECTOR	VKN1439
KN0405	VNF1084
CN0101 23P FFC CONNECTOR	9604S-23C
CN5001 CONNECTOR POST	B2B-PH-K-S
CN0303 CONNECTOR POST	B5B-PH-K-S
JA4001, JA4002 REMOCON JACK	RKN1004
JA2004 1P PIN JACK	VKB1159
JA2010 3P PIN JACK	VKB1165
JA2001 JACK	VKB1192
JA2003 JACK	VKB1193
CN0102 9P FFC CONNECTOR	VKN2015

B SCRB ASSY

SEMICONDUCTORS

IC2000	BH7236AF
IC2002	LA7213
IC2004	TC7SU04FU
IC0806	TC7W53FU
Q0806, Q2006, Q2010, Q2011	2SA1576A
Q0810-Q0812, Q2002	2SC4081
Q0820, Q0821, Q0823, Q0824	2SD2114K
Q0803, Q0805	DTA124EUA
Q2001, Q2003, Q2005	HN1C01FU
Q0804	UMH1N
D0801, D0820, D0829	1SS355
D0830, D0831	DAN217U

Mark	No.	Description	Part No.
	D0816, D0819		UDZS5R1(B)
	D0802-D0815, D0822-D0826, D0828		UMZ6R8N
	COILS AND FILTERS		
	L0801, L0802		CTF1388
	L2000		LAU680J
	CAPACITORS		
	C0846-C0849		CCSRCH102J50
	C2012		CCSRCH220J50
	C0871, C0873		CCSRCH221J50
	C2005, C2009		CCSRCH270J50
	C0836-C0845, C2092, C2093		CCSRCH471J50
	C2084		CEAT101M10
	C0834		CEAT101M16
	C0018, C0027		CEAT102M6R3
	C2001-C2003, C2105		CEAT221M6R3
	C2006		CEAT2R2M50
	C0035-C0037		CEAT471M6R3
	C0060-C0063		CEAT4R7M50
	C2089-C2091		CKSRYB104K16
	C2104		CKSRYB221K50
	C2008, C2011, C2123-C2125		CKSRYF104Z25
	RESISTORS		
	R0004, R0008-R0010, R0856, R0861		RS1/10S0R0J
	R0810		RS1/10S561J
	R0007, R0077-R0080, R0842, R0855		RS1/10S75R0F
	R0857, R0863		RS1/10S75R0F
	R2012, R2018, R2025		RS1/16S1001F
	R2007, R2022, R2030		RS1/16S6800F
	R2001, R2002, R2015		RS1/16S82R0F
	Other Resistors		RS1/16S###J
	OTHERS		
	JA0801, JA0802	RGB CONNECTOR	VKB1157
	CN0001, CN0002	29P FFC CONNECTOR	VKN1260
	X2000 (4.433619MHz)		VSS1201

C FJKB ASSY

Mark	No.	Description	Part No.
	SEMICONDUCTORS		
	D7301-D7304		UMZ6R8N
	CAPACITORS		
	C7303, C7305		CCSRCH471J50
	OTHERS		
	KN7301	WRAPPING TERMINAL	VNF1084
	CN7301	23P FFC CONNECTOR	9604S-23C
	CN7302	12P FFC CONNECTOR	9604S-12C
	JA7301	4P MINIDIN SOCKET(S)	AKP1238
	JA7302	3P PIN JACK	VKB1208

D FLKY ASSY

Mark	No.	Description	Part No.
	SEMICONDUCTORS		
	IC7001		PT6315
	IC7002		RPM7140-H9
	Q7004		2SA1576A
	Q7005		2SC4081
	Q7003		2SC5712
	Q7001		DTC124EUA
	D7001		SLR-343BBT
	D7002		SLR-343DC
	D7004		1SS355
⚠	D7003, D7007		RF101L2S
	D7008		UDZS13(B)
	D7005		UDZS15(B)
	D7006		UDZS2R4(B)
	D7014		SLR-343VC
	TRANSFORMERS		
⚠	T7001		VTT1171
	SWITCHES AND RELAYS		
	S7001-S7010		VSG1024
	COILS AND FILTERS		
	L7001		LAU220J
	CAPACITORS		
	C7021		CEAL100M50
	C7016, C7027		CEAL101M10
	C7017		CEAL101M16
	C7003, C7004, C7023		CKSRYB103K50
	C7018		CKSRYB223K25
	C7001, C7007, C7014, C7015, C7020		CKSRYF104Z25
	C7026, C7028, C7034		CKSRYF104Z25
	C7008		CKSRYF104Z50
	RESISTORS		
	R7018		RS1/10S221J
	Other Resistors		RS1/16S###J
	OTHERS		
	CN7001	12P FFC CONNECTOR	9604S-12C
	J7001	CONNECTOR ASSY	PF03PG-B05
	V7001	FLUORESCENT TUBE	VAW1091
		FL HOLDER	VNF1134

E KEYB ASSY

Mark	No.	Description	Part No.
	SWITCHES AND RELAYS		
	S7201		VSG1024
	OTHERS		
	CN7201	CONNECTOR POST	B3B-PH-K-S

F MAIN ASSY (DVR-645H-S)

Mark	No.	Description	Part No.
	SEMICONDUCTORS		
	IC3101		AK5359ET
	IC5631		BD6517F
	IC0501		BD7997FS
	IC2401, IC2402		CEK1285
	IC1201, IC1221		K4H511638C-UCB3
	IC2202		MM1501XN
	IC2201		MM1503XN
⚠	IC5621		MM1565AF
	IC1301		NJM12904V
	IC3201		PCM1742KE
	IC6001		PDC147A8
	IC3707		PST3813U
⚠	IC4512		S-1170B25UC-OTK
⚠	IC4507, IC4511		S-1170B33UC-OTS
⚠	IC4504		S-1170B50UC-OUJ

Mark No.	Description	Part No.
IC3103, IC6003		TC74VHC157FTS1
IC6091, IC6092		TC7PA53FU
IC3501		TC7SH08FUS1
IC3102		TC7SZ126FU
IC6002		TC7WH08FU
IC6004		TC7WH241FU
IC5701		TDOTG242-0F0C8
IC0101		UPC3345GC-YEB-A
IC3202		UPC4570G2-A
IC1001		UPD61272F1-107KA3A
IC1102		VYW2390
Q1801, Q1811, Q2205, Q2206		2SA1576A
Q2501-Q2505		2SA1576A
Q3501, Q4561		2SC4081
Q0101		RT1N141U
Q5701		UMD2N
D3201		DAN202U
D3711, D3712		RB501V-40
D0101		SML-310YT

COILS AND FILTERS

L0106, L0107, L0112, L1010	BTH1103
L1001, L1003, L1004, L1006-L1008	DTL1106
L1201, L3102, L5701	DTL1106
L1811	LCYA150J2520
L1801	LCYA390J2520

CAPACITORS

C1001	ACH7195
C1081	CCSSCH100D50
C0158-C0162, C1813, C6008	CCSSCH101J50
C3207, C3211	CCSSCH121J50
C1902, C1911	CCSSCH150J50
C1812	CCSSCH151J50
C1901, C1912	CCSSCH180J50
C1803	CCSSCH221J50
C0169, C0171, C0509	CCSSCH390J50
C3501, C3808-C3810	CCSSCH470J50
C1084-C1087	CCSSCH5R0C50
C0510	CCSSCH620J50
C0264	CCSSCH680J50
C5721, C5722	CCSSCK2R0C50
C3212	CEAT102M6R3
C1708, C4507	CEVW100M16
C2506, C3106, C3214, C3216, C4542	CEVW101M16
C4563, C5624	CEVW101M16
C1003, C1005, C1014, C1020, C1071	CEVW221M4
C1074, C1235, C5701	CEVW221M4
C0511	CKSQYB105K16
C5623	CKSQYB225K10
C0105, C0121-C0123, C0125, C0133	CKSQYB475K6R3
C0135, C0152, C0153, C0155, C0165	CKSQYB475K6R3
C0168, C0178, C0181, C0184, C1073	CKSQYB475K6R3
C1076, C4508, C4525, C4526	CKSQYB475K6R3
C4548, C4549, C4552, C5725	CKSQYB475K6R3
C0157, C2221, C2222, C4551	CKSRYB105K10
C0109, C0111	CKSRYB334K10
C0101, C0102, C0136	CKSRYB474K10
C0296, C1009, C1015, C1018, C1021	CKSRYF105Z10
C1024, C1044, C1047, C1052, C1055	CKSRYF105Z10
C1061, C1062, C1065, C1070, C1113	CKSRYF105Z10
C1202, C1204, C1208, C1221, C1223	CKSRYF105Z10
C1227, C1421, C1801, C1811	CKSRYF105Z10
C2208, C2209, C2501, C3102, C3103	CKSRYF105Z10
C3107, C3502, C3511, C3738	CKSRYF105Z10
C3801-C3803, C3805, C5621, C5702	CKSRYF105Z10
C5711-C5720, C6009, C6011, C6013	CKSRYF105Z10
C6071, C6091, C6092	CKSRYF105Z10
C0151, C0189, C0261, C1010, C1016	CKSSYB102K50
C1019, C1022, C1025, C1046, C1049	CKSSYB102K50
C1054, C1057, C1059, C1064	CKSSYB102K50
C1067, C1068, C1207, C1209, C1210	CKSSYB102K50
C1226, C1228, C1229, C4527, C4550	CKSSYB102K50
C5506, C5622	CKSSYB102K50
C0119, C0129, C0130, C0142, C0164	CKSSYB103K16
C0187, C0188, C0221, C1205, C1206	CKSSYB103K16
C1224, C1225, C1709, C2223, C2224	CKSSYB103K16
C3701, C4509	CKSSYB103K16
C0103, C0104, C0112, C0117, C0124	CKSSYB104K10
C0126-C0128, C0132, C0143, C0144	CKSSYB104K10
C0150, C0156, C0163, C0167, C0172	CKSSYB104K10
C0175, C0260, C0504, C0505, C1026	CKSSYB104K10
C1029, C1034, C1037, C1040, C1043	CKSSYB104K10
C2301, C2302, C3806, C3815, C3816	CKSSYB104K10
C0137	CKSSYB182K50
C0145, C0146	CKSSYB222K50
C0224, C0230, C0231	CKSSYB223K16
C0108, C0110, C0139, C0141, C1802	CKSSYB331K50
C3204	CKSSYB331K50
C0114	CKSSYB332K50
C0116	CKSSYB333K10
C0232, C0233	CKSSYB471K50
C0148, C0220, C0223	CKSSYB472K25
C0147, C0532, C1804, C1814	CKSSYB473K10
C0297, C3208, C3210	CKSSYB681K50
C0138	CKSSYB682K25
C0154, C0236	CKSSYB683K10
C0115	CKSSYB822K16
C0501, C0503, C1002, C1004, C1007	CKSSYF104Z16
C1045, C1048, C1050, C1051, C1053	CKSSYF104Z16
C1056, C1058, C1060, C1063, C1066	CKSSYF104Z16
C1069, C1082, C1105, C1203	CKSSYF104Z16
C1211-C1214, C1222, C1230	CKSSYF104Z16
C1302, C1303, C1312, C1313	CKSSYF104Z16
C1701-C1707, C2401-C2406, C3101	CKSSYF104Z16
C3108, C3201-C3203, C3206, C3209	CKSSYF104Z16
C4561, C4562, C4565, C5512	CKSSYF104Z16
C6003-C6005, C6007, C6012	CKSSYF104Z16
C0113	DCG1040
C0502	DCH1165
C0107, C0118, C1008, C1017, C1075	DCH1201
C2210, C2217, C5727-C5729	DCH1201
C4554, C4555	VCG1058
C1215	VCH1246

RESISTORS

R0501	DCN1160
R0502	DCN1162
R3854, R6039, R6040	RAB4CQ0R0J
R0240, R1411, R3102	RAB4CQ103J
R3801-R3806	RAB4CQ223J

Mark	No.	Description	Part No.
	R1245, R1246, R1255, R1256		RAB4CQ330J
	R1265, R1266, R1273, R1274		RAB4CQ330J
	R3810-R3813, R3824		RAB4CQ330J
	R0254		RAB4CQ473J
	R1241, R1242, R1248, R1249		RAB4CQ560J
	R1261, R1262, R1268, R1269		RAB4CQ560J
	R1281-R1283, R1287		RAB4CQ560J
	R3208, R3223		RN1/16SC56R0D
	R3207, R3226		RN1/16SE1502D
	R3209, R3224		RN1/16SE8201D
	R0133, R1001, R1002, R2401		RS1/10S0R0J
	R4513, R4514, R4517, R4520-R4524		RS1/10S0R0J
	R4527, R4591-R4593, R5702		RS1/10S0R0J
	R1302, R1303, R1312, R1313		RS1/16S1001F
	R5716		RS1/16S1501F
	R2502, R2505, R2508, R2511, R2514		RS1/16S2000F
	R1301		RS1/16S4700F
	R0181		RS1/16S4701F
	R1052		RS1/16S6200F
	R3505		RS1/16S75R0F
	R1054		RS1/16S9100F
	R0510, R0511		RS1/4SA2R0J
	Other Resistors		RS1/16S###J

OTHERS

	X1001 (24.576MHz)		VSS1192
	X1002 (27MHz)		VSS1191
	X5701 (6MHz)		VSS1210
	X6001 (12MHz)		VSS1216
	X0201 (16.93MHz)		DSS1152
	CN0502	4P FFC CONNECTOR	DKN1288
	CN0501	FFC CONNECTOR	DKN1312
	CN0601	5P FFC CONNECTOR	DKN1402
	CN0101	50P FFC CONNECTOR	DKN1404
	CN1402	7P FFC CONNECTOR	RKN1048
	CN5601	CONNECTOR POST	S10B-PH-K-S
	CN2401	KR CONNECTOR	S13B-PH-K-S
	CN6002	9P FFC CONNECTOR	VKN1413
	CN2301	35P FFC CONNECTOR	VKN1439
	CN0401	10P FFC CONNECTOR	VKN2029
	CN1401	14P FFC CONNECTOR	VKN2030
	CN2601	14P FFC CONECTOR	VKN2040
	CN3802	24P FFC CONNECTOR	VKN2045
	CN3801, CN6001	40P FFC CONNECTOR	VKN2050

F MAIN ASSY (DVR-545H-S)

SEMICONDUCTORS

	IC3101		AK5359ET
	IC0501		BD7997FS
	IC2401, IC2402		CEK1285
	IC1201, IC1221		K4H511638C-UCB3
	IC1301		NJM12904V
	IC3201		PCM1742KE
	IC6001		PDC147A8
	IC3707		PST3813U
⚠	IC4512		S-1170B25UC-OTK
⚠	IC4507, IC4511		S-1170B33UC-OTS
⚠	IC4504		S-1170B50UC-OUJ
	IC6003		TC74VHC157FTS1
	IC3501		TC7SH08FUS1
	IC6002		TC7WH08FU
	IC0101		UPC3345GC-YEB-A
	IC3202		UPC4570G2-A
	IC1001		UPD61272F1-107KA3A
	IC1102		VYW2389
	Q1801, Q1811, Q2205, Q2206		2SA1576A
	Q2501-Q2505		2SA1576A
	Q3501, Q4561		2SC4081
	Q0101		RT1N141U
	D3201		DAN202U
	D3711, D3712		RB501V-40
	D0101		SML-310YT

COILS AND FILTERS

	L0106, L0107, L0112, L1010		BTH1103
	L1001, L1003, L1004, L1006-L1008		DTL1106
	L1201		DTL1106
	L1811		LCYA150J2520
	L1801		LCYA390J2520

CAPACITORS

	C1081		CCSSCH100D50
	C0158-C0162, C1813, C6008		CCSSCH101J50
	C3207, C3211		CCSSCH121J50
	C1902, C1911		CCSSCH150J50
	C1812		CCSSCH151J50
	C1901, C1912		CCSSCH180J50
	C1803		CCSSCH221J50
	C0169, C0171, C0509		CCSSCH390J50
	C3501		CCSSCH470J50
	C1084-C1087		CCSSCH5R0C50
	C0510		CCSSCH620J50
	C0264		CCSSCH680J50
	C3212		CEAT102M6R3
	C1708, C4507		CEVW100M16
	C2506, C3106, C3214, C3216, C4542		CEVW101M16
	C4563		CEVW101M16
	C1001, C1003, C1005, C1014, C1020		CEVW221M4
	C1071, C1074, C1235		CEVW221M4
	C0511		CKSQYB105K16
	C0105, C0121-C0123, C0125, C0133		CKSQYB475K6R3
	C0135, C0152, C0153, C0155, C0165		CKSQYB475K6R3
	C0168, C0178, C0181, C0184, C1073		CKSQYB475K6R3
	C1076, C4508, C4525, C4526		CKSQYB475K6R3
	C4548, C4549, C4552		CKSQYB475K6R3
	C0157, C4551		CKSRYB105K10
	C0109, C0111		CKSRYB334K10
	C0101, C0102, C0136		CKSRYB474K10
	C0296, C1009, C1015, C1018, C1021		CKSRYF105Z10
	C1024, C1044, C1047, C1052, C1055		CKSRYF105Z10
	C1061, C1062, C1065, C1070, C1113		CKSRYF105Z10
	C1202, C1204, C1208, C1221, C1223		CKSRYF105Z10
	C1227, C1421, C1801, C1811		CKSRYF105Z10
	C2208, C2209, C2501, C3102, C3103		CKSRYF105Z10
	C3502, C3511, C3738, C3801-C3803		CKSRYF105Z10
	C3805, C6009, C6011, C6013		CKSRYF105Z10
	C0151, C0189, C0261, C1010, C1016		CKSSYB102K50
	C1019, C1022, C1025, C1046, C1049		CKSSYB102K50
	C1054, C1057, C1059, C1064		CKSSYB102K50
	C1067, C1068, C1207, C1209, C1210		CKSSYB102K50
	C1226, C1228, C1229, C4527, C4550		CKSSYB102K50

Mark No.	Description	Part No.
	C0119, C0129, C0130, C0142, C0164	CKSSYB103K16
	C0187, C0188, C0221, C1205, C1206	CKSSYB103K16
	C1224, C1225, C1709, C3701, C4509	CKSSYB103K16
	C0103, C0104, C0112, C0117, C0124	CKSSYB104K10
	C0126-C0128, C0132, C0143, C0144	CKSSYB104K10
	C0150, C0156, C0163, C0167, C0172	CKSSYB104K10
	C0175, C0260, C0504, C0505, C1026	CKSSYB104K10
	C1029, C1034, C1037, C1040, C1043	CKSSYB104K10
	C2301, C2302, C3806	CKSSYB104K10
	C0137	CKSSYB182K50
	C0145, C0146	CKSSYB222K50
	C0224, C0230, C0231	CKSSYB223K16
	C0108, C0110, C0139, C0141, C1802	CKSSYB331K50
	C3204	CKSSYB331K50
	C0114	CKSSYB332K50
	C0116	CKSSYB333K10
	C0232, C0233	CKSSYB471K50
	C0148, C0220, C0223	CKSSYB472K25
	C0147, C0532, C1804, C1814	CKSSYB473K10
	C0297, C3208, C3210	CKSSYB681K50
	C0138	CKSSYB682K25
	C0154, C0236	CKSSYB683K10
	C0115	CKSSYB822K16
	C0501, C0503, C1002, C1004, C1007	CKSSYF104Z16
	C1045, C1048, C1050, C1051, C1053	CKSSYF104Z16
	C1056, C1058, C1060, C1063, C1066	CKSSYF104Z16
	C1069, C1082, C1105, C1203	CKSSYF104Z16
	C1211-C1214, C1222, C1230	CKSSYF104Z16
	C1302, C1303, C1312, C1313	CKSSYF104Z16
	C1701-C1707, C2401-C2406, C3101	CKSSYF104Z16
	C3201-C3203, C3206, C3209	CKSSYF104Z16
	C4561, C4562, C4565, C6003-C6005	CKSSYF104Z16
	C6007, C6012	CKSSYF104Z16
	C0113	DCG1040
	C0502	DCH1165
	C0107, C0118, C1008, C1017, C1075	DCH1201
	C2210, C2217	DCH1201
	C4554, C4555	VCG1058
	C1215	VCH1246

RESISTORS

	R0501	DCN1160
	R0502	DCN1162
	R6039, R6040	RAB4CQ0R0J
	R0240, R1411, R3102	RAB4CQ103J
	R3801-R3806	RAB4CQ223J
	R1245, R1246, R1255, R1256	RAB4CQ330J
	R1265, R1266, R1273, R1274	RAB4CQ330J
	R3810-R3813, R3824	RAB4CQ330J
	R0254	RAB4CQ473J
	R1241, R1242, R1248, R1249	RAB4CQ560J
	R1261, R1262, R1268, R1269	RAB4CQ560J
	R1281-R1283, R1287	RAB4CQ560J
	R3208, R3223	RN1/16SC56R0D
	R3207, R3226	RN1/16SE1502D
	R3209, R3224	RN1/16SE8201D
	R0133, R1001, R1002, R2401	RS1/10S0R0J
	R4513, R4514, R4520-R4524, R4527	RS1/10S0R0J
	R4591-R4593	RS1/10S0R0J
	R1302, R1303, R1312, R1313	RS1/16S1001F
	R2502, R2505, R2508, R2511, R2514	RS1/16S2000F
	R1301	RS1/16S4700F
	R0181	RS1/16S4701F
	R1052	RS1/16S6200F
	R3505	RS1/16S75R0F
	R1054	RS1/16S9100F
	R0510, R0511	RS1/4SA2R0J
	Other Resistors	RS1/16S###J

OTHERS

	X0201 (16.93MHz)	DSS1152
	X1001 (24.576MHz)	VSS1192
	X1002 (27MHz)	VSS1191
	X6001 (12MHz)	VSS1216
	CN0502 4P FFC CONNECTOR	DKN1288
	CN0501 FFC CONNECTOR	DKN1312
	CN0601 5P FFC CONNECTOR	DKN1402
	CN0101 50P FFC CONNECTOR	DKN1404
	CN1402 7P FFC CONNECTOR	RKN1048
	CN2401 CONNECTOR POST	S13B-PH-K-S
	CN6002 9P FFC CONNECTOR	VKN1413
	CN2301 35P FFC CONNECTOR	VKN1439
	CN0401 10P FFC CONNECTOR	VKN2029
	CN1401 14P FFC CONNECTOR	VKN2030
	CN3801, CN6001 40P FFC CONNECTOR	VKN2050

G HDMIB ASSY

SEMICONDUCTORS

	IC0101	CD0041AF
	IC0102	HY57V161610FTP-7
⚠	IC0301	NJM2880U1-05
⚠	IC0302	S-1170B18UC-OTD
⚠	IC0303	S-1170B33UC-OTS
	IC0201	SII9030CTU
	IC0202	TC74LCX08FTS1
	IC0103	TC74LCX573FTS1
	IC0104	TC7SH04FUS1
	Q0205	2SA1576A
	Q0201	DTC124EUA
	Q0204	HN1C01FU
	Q0203	UM6K1N
	Q0202	UMB1N
	D0303, D0306	1SR154-400
	D0307	RB161M-20
	D0302	RB501V-40

COILS AND FILTERS

	L0201-L0204	ATH7022
	L0104	CTF1399

CAPACITORS

	C0326, C0328	CEVW220M6R3
	C0327, C0329	CEVW470M6R3
	C0307, C0310	CKSQYB102K50
	C0101, C0105, C0134, C0201, C0203	CKSQYB105K16
	C0301, C0304, C0306, C0309, C0311	CKSQYB105K16
	C0302	CKSQYB225K10
	C0312	CKSQYB475K6R3
	C0209, C0211	CKSRYB102K50
	C0104	CKSRYB333K16
	C0103	CKSRYB334K10

Mark	No.	Description	Part No.
	C0107-C0133, C0223, C0224		CKSRYF104Z16
	C0135, C0136, C0144, C0205-C0208		CKSRYF105Z10
	C0210, C0212-C0218, C0222, C0225		CKSRYF105Z10
	C0303		CKSRYF105Z10
	C0137-C0142		CKSSYF104Z16

RESISTORS

R0129, R0130		RAB4CQ0R0J
R0127, R0128		RAB4CQ101J
R0121-R0126		RAB4CQ470J
R0134, R0135, R0137, R0138		RAB4CQ680J
R0111-R0113, R0115, R0201-R0206		RS1/10S0R0J
R0210, R0213, R0246		RS1/10S0R0J
R0263		RS1/16SS4700F
Other Resistors		RS1/16S###J

OTHERS

JA0201	HDMI CONNECTOR	AKP7210
CN0101	18P FFC CONNECTOR	VKN1811

H DVJB ASSY (DVR-645H-S Only)

SEMICONDUCTORS

IC101		ADV7172KSTZ
IC103		HY57V161610ETP-8
IC105, IC107		NJU7013F
⚠ IC106		S-1170B25UC-OTK
IC104		TC7WHU04FU
IC108		UPD72852AGB-8EU-A
IC102		UPD72893BF1-FN3
Q101-Q104		2SA1576A
D101		HVC359
D102		HVC362

COILS AND FILTERS

F101	CHIP COIL	DTF1069
L106, L107	EMI FILTER	DTL1106
L101, L102		LCYA100J2520
L109, L111		LCYA150J2520
L108, L110		LCYA180J2520
L104, L105	COIL	VTH1043

CAPACITORS

C200, C218		CCSRCH100D50
C258		CCSRCH271J50
C211, C213		CCSRCH330J50
C212		CCSRCH5R0C50
C254, C255		CCSRCH8R0D50
C107, C112		CCSSCH330J50
C161-C163		CCSSCH470J50
C103, C108		CCSSCH680J50
C104, C109		CCSSCH7R0D50
C106, C111		CCSSCH820J50
C105, C110		CCSSCJ3R0C50
C144, C220, C223		CEVW221M4
C101, C102, C122, C126, C140		CKSQYF106Z10
C142, C147, C204, C207, C214		CKSQYF106Z10
C230, C233, C248, C252		CKSQYF106Z10
C222		CKSQYF475Z10
C201, C205		CKSRYB104K16
C203, C210, C245, C249, C250		CKSRYF104Z25
C124, C127-C135, C141, C143		CKSRYF105Z10
C146, C148-C160, C206, C215		CKSRYF105Z10

Mark	No.	Description	Part No.
	C231, C240, C241, C243, C244		CKSRYF105Z10
	C246, C247, C251, C253		CKSRYF105Z10
	C256, C257		CKSRYF105Z10
	C216		CKSRYF473Z25
	C145, C235		CKSSYB103K16
	C113-C117, C123, C125, C136		CKSSYF104Z16
	C232, C234, C237, C242		CKSSYF104Z16
	C259-C261		CKSSYF104Z16

RESISTORS

R144-R149, R155-R158		RAB4CQ103J
R169-R172, R185-R188		RAB4CQ103J
R150, R151		RAB4CQ470J
R248		RN1/16SE9101D
R141, R197, R198, R211, R215		RS1/10S0R0J
R105, R111		RS1/16S1500F
R268		RS1/16S5101F
R264-R267		RS1/16S56R0D
R135		RS1/16S6800F
Other Resistors		RS1/16S###J

OTHERS

JA101	1394-TERMINAL	VKN2028
CN101	CONNECTOR	VKN2045
X102	(24.576MHz) CRYSTAL	VSS1184
X101	(27.000MHz) VCXO	VSS1195

I USBB ASSY (DVR-645H-S Only)

COILS AND FILTERS

L105, L106	COIL	VTH1054
L101-L104	CHIP FERRITE BEAD	VTL1169

CAPACITORS

C102		CEVW221M6R3
C101		CKSRYF104Z25

RESISTORS

Other Resistors		RS1/16S###J

OTHERS

CN101	CONNECTOR	B10B-PH-K
JA101	USB CONNECTOR	VKB1226
JA102	USB CONNECTOR	VKB1227

J ATAB ASSY

RESISTORS

R13-R20		RAB4C0R0J

OTHERS

CN12	40P ATA CONECTOR	VKN1816
CN11	40P CONNECTOR	VKN1818

K POWER SUPPLY UNIT

POWER SUPPLY UNIT has no service part.

6. ADJUSTMENT

[Purpose]

If the combination of MAIN Assy and LOADER Assy is changed, the adjusted value for LD power will be shifted, and stable playback or recording of a disc will become impossible. Therefore, when the combination of MAIN Assy and LOADER Assy is changed, LD power adjustment and adjustment for disc judgment will be necessary.
Be sure to do this adjustment at following cases.

- When replacing MAIN Assy
- When replacing LOADER Assy

[Tools to be used]

- Special tool for adjusting the LD power (GGF1559)
- 10-pin FFC flexible cable (GGD1477)
- CD-ROM test disc: CDT-313 (GGV1054)
- DVD dual-layer test disc: DVDT-002 (GGV1036)

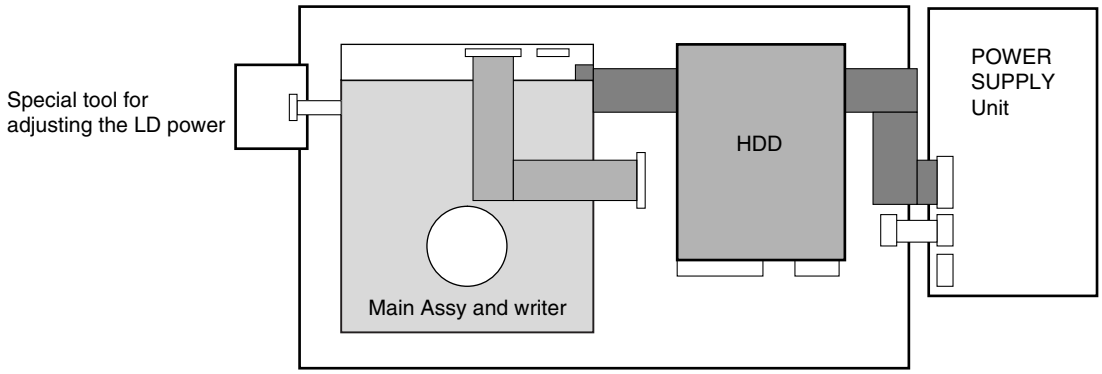
[Notes]

Never turn the power off while any of the following operations is in progress:

- While laser diode (LD) power adjustment is being performed normally by the unit
- While adjustment for disc judgment is being performed

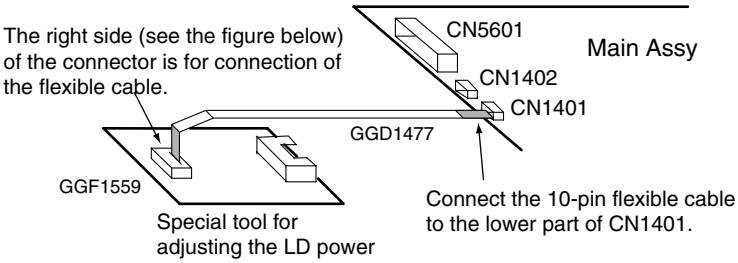
[Connections]

- Connections for adjusting the LD power

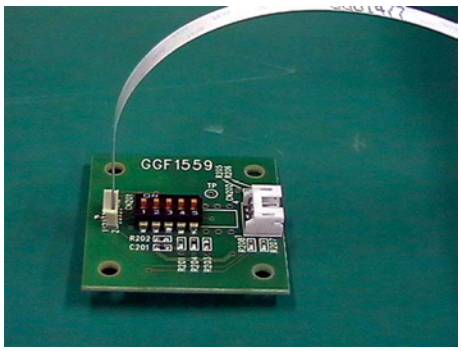


Note: Before adjusting the LD power, disconnect the power to the HDD and the flexible cable for ATA (40-pin).

- To which the special tool for adjusting the LD power is connected



- Setting of the switches on the special tool for adjusting the LD power



GGF1559

Set all five switches to ON.

[Procedures]

1. Connect the special tool for adjusting the LD power, as shown on the previous page.

2. Turn on the DVD recorder. ("POWER ON" will be indicated on the FL display.)

3. The tray opens.
   Make sure that powered opening of the tray is working.
   If the tray does not open under power:
   a. Flexible cables or other cables may not be connected. (Connection of cables to the HDD is not necessary.)
   b. Wrong setting of the switches on the special tool for adjusting the LD power, or failure in the special tool or the 10-pin flexible cable, is suspected.
   c. Failure in the loader, MAIN Assy, or POWER SUPPLY Unit is suspected.

   Make sure that the LED next to CN401 is lit.
   If the LED flashes:
   a. Wrong setting of the switches on the special tool for adjusting the LD power, or failure in the special tool or the 10-pin flexible cable, is suspected.

4. Manually close the tray. Adjust the LD power.
   Make sure that the LED next to CN401 is lit.
   If the LED flashes three or four times in a burst:
   a. The PU flexible cable may not be connected.
   b. Failure in the Traverse Mechanism or MAIN Assy is suspected.

5. After adjusting the LD power, invoke powered opening of the tray.
   Make sure that the LED next to CN401 flashes once per burst.

6. Load the DVDT-002 on the tray.
   The tray automatically closes after 15 seconds.
   The tray repeatedly closes and opens automatically until a disc is loaded.

7. After adjustment for judging the DVD disc, the tray automatically opens.
   Make sure that the LED next to CN401 flashes twice in a burst.
   If the LED flashes only once per burst:
   a. A disc other than the DVDT-002 may be loaded. Be sure to load the DVDT-002.

8. Replace the DVDT-002 with the CDT-313.
   The tray automatically closes after 15 seconds.
   The tray repeatedly closes and opens automatically until a disc is loaded.

9. After adjustment for judging the CD disc, the tray automatically opens.
   Make sure that the LED next to CN401 is unlit.
   If the LED flashes twice in a burst:
   a. A disc other than the CDT-313 may be loaded. Be sure to load the CDT-313.

10. Unload the CDT-313 and manually close the tray.

11. Turn off the recorder by holding the POWER button pressed for several seconds.

12. Disconnect the 10-pin FFC cable from the MAIN Assy.

13. Set the power sources for the HDD and the flexible connecting cable for ATA (40-pin) to their original statuses.

[Points to be confirmed]

1. Make sure that real-time recording on a DVD-R/-RW/RAM will finish normally.
2. Play back a recorded disc and make sure that playback is performed without a problem.

7. GENERAL INFORMATION
7.1 DIAGNOSIS

◆ Jigs and Tools to be used

Remote control unit for servicing (GGF1381) DVD Recorder Data Disc (Type 2)(*) Download disc Test disc (GGV1025) DVD-RW (Commercial goods)	(*) Be sure to use the latest disc (Type 2). In April, 2006, the latest disc is GGV1238.

◆ Service Mode List

1. Setting type

Item	When to perform
7.1.1 Model setting	• When replacing MAIN ASSY or TUJB ASSY
7.1.2 CPRM ID number and data	• When "CPRM ERROR" is displayed on the display screen • After the MAIN ASSY or HDD replaced.
7.1.3 Firmware downloading method	• After model setting (After replacing MAIN ASSY, TUJB ASSY) • After the HDD is replaced. • When NG is displayed for the version infomation in Service mode
7.1.4 Video Adjustment for Specific Area	• When a flicker appears on the tuner display like a horizontal or vertial out-of-sync symptom
7.1.5 (5) OSD Filter Setting	• When a character flicker appears on the OSD depending on the monitor

2. Diagnosis type

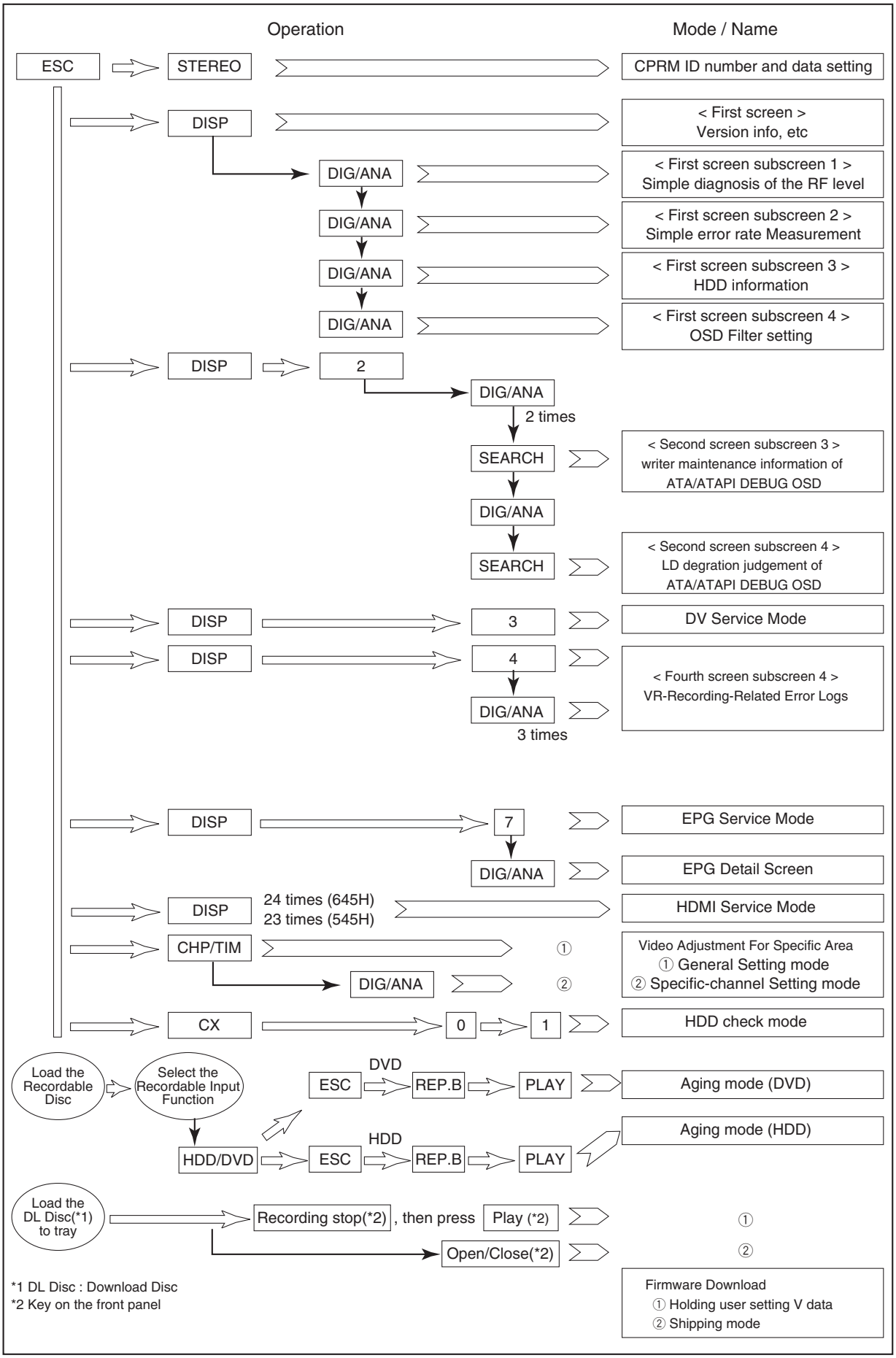
7.1.5 Service Mode First screen : Version, Simple diagnosis of the RF level, Simple error rate measurement, HDD information. Second screen : ATA/ATAPI debug screen, LD degration judgement Fourth screen : VR-recording-related error loss	• When confirming version infomation • When confirming the state of LOADER Assy
7.1.6 DV Service Mode (DVR-645H-S only)	When any failures occurs while a DV device connected
7.1.7 EPG Service Mode	When EPG data cannnot be or can be only partially obtained.
7.1.8 HDMI Service Mode	When any failures occurs while a HDMI device connected
7.1.9 Aging Mode	When a claimed sympton is difficult to reproduce
7.1.10 HDD Check Mode	When checking the quality of HDD

◆ Necessary procedure List when replacing Assys

Following is the surely necessary procedures and the product state after changing, when replacing next ASSYs.

Replaced ASSY	Necessary setting	State after replacing	
		User setting	HDD contents
MAIN ASSY	1. Model setting 2. LD power adjustment 3. CPRM setting 4. Firmware update	×	○
TUJB ASSY	1. Model setting 2. CPRM setting 3. Firmware update	×	○
LOADER ASSY	1. LD power adjustment	○	○
HDD	1. CPRM setting	○	×

◆SERVICE MODE MAP



7.1.1 MODEL SETTING

[Purposes]

When the MAIN Assy and/or TUJB Assy that are(is) commonly used with another model are(is) replaced, they(it) must recognize the model of this unit.

Items to be set: The model number, destination, and region No. must be set.

[Tool to be used]

Remote control unit for servicing
(GGF1381)

[Notes]

- Once the setting has been made, it can never be changed. Be sure to make the setting correctly.
- As this setting resets the Assy(s) in question to the factory-preset status, it is recommended that you obtain the customer's consent beforehand.

[Procedures]

① After power on, the following screen is displayed on TV monitor. Press four digits properly (for example " 0902 ") by using the remote control unit for service, according to the screen information.

[DVR-645H-S model]

```
[Recorder's Model Setting]
  Input the number using the remote for Service.

> - - -

   Input No.      Model
   [ 0902   :  DVR-645H/WY ]
   [ 0903   :  DVR-645H/WV ]
   [ 0904   :  DVR-645H/WYRE ]
```

[DVR-545H-S model]

```
[Recorder's Model Setting]
  Input the number using the remote for Service.

> - - -

   Input No.      Model
   [ 0802   :  DVR-545H/WY ]
   [ 0803   :  DVR-545H/WV ]
   [ 0804   :  DVR-545H/WYRE ]
```

② Disconnect then reconnect the AC power cord of the unit. Be careful not to impart vibration to the unit immediately after the AC power cord is disconnected.

③ Reset the recorder to all its factory settings.
(Make sure that the recorder is on. Press and hold ■ (STOP) key and press ⏻ (STANDBY/ON) key on the front panel.)
The recorder turns off with all settings reset.

④ Press [ESC] then [DISP] keys by using the remote control unit for servicing, and then confirm each Model Name (for example " DVR-645H/WY ").

```
DVR-645H/WY        VERSION  :  1.**
  SYSCON    :  RELEASE_421
               Rev     :1.13877. 2. 56
TUNERCON  :  483.079                    OK
    DRIVE   :  DVD-RW DVR-L11X          OK
               1.05                     OK

   HDD INT :  WDC WD800BB-xxJK          80

    TBCON  :  119.00

  DEVICE    :  E2R-FE  1.2     FLASH  :  64M
  REGION    :  2               C  :  * * * * * * * * *
```

⑤ End

7.1.2 CPRM ID NUMBER AND DATA SETTING

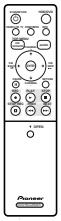
[Purposes]

For the DVD recorder,it is necessary with the recoding/playback of DVD–RW disc to set an individual number (ID number) and ID data to each recorder. If the number and data are not set correctly with the following procedure, cannot work with residual quantity 0:00 or operations in the future may not be guaranteed with RW disc. You will find the ID number to be set on the ID label on the rear panel.

The Input is Necessary When:

- " CPRM ERR" is displayed on the FL display immediately after the power is turned on or in Stop mode.
- When the MAIN ASSY or the HDD is exchanged.

[Tools to be used]



Remote control unit supplied with the unit (VXX3129)

Remote control unit for servicing (GGF1381)

DVD Recorder Data Disc (Type 2)

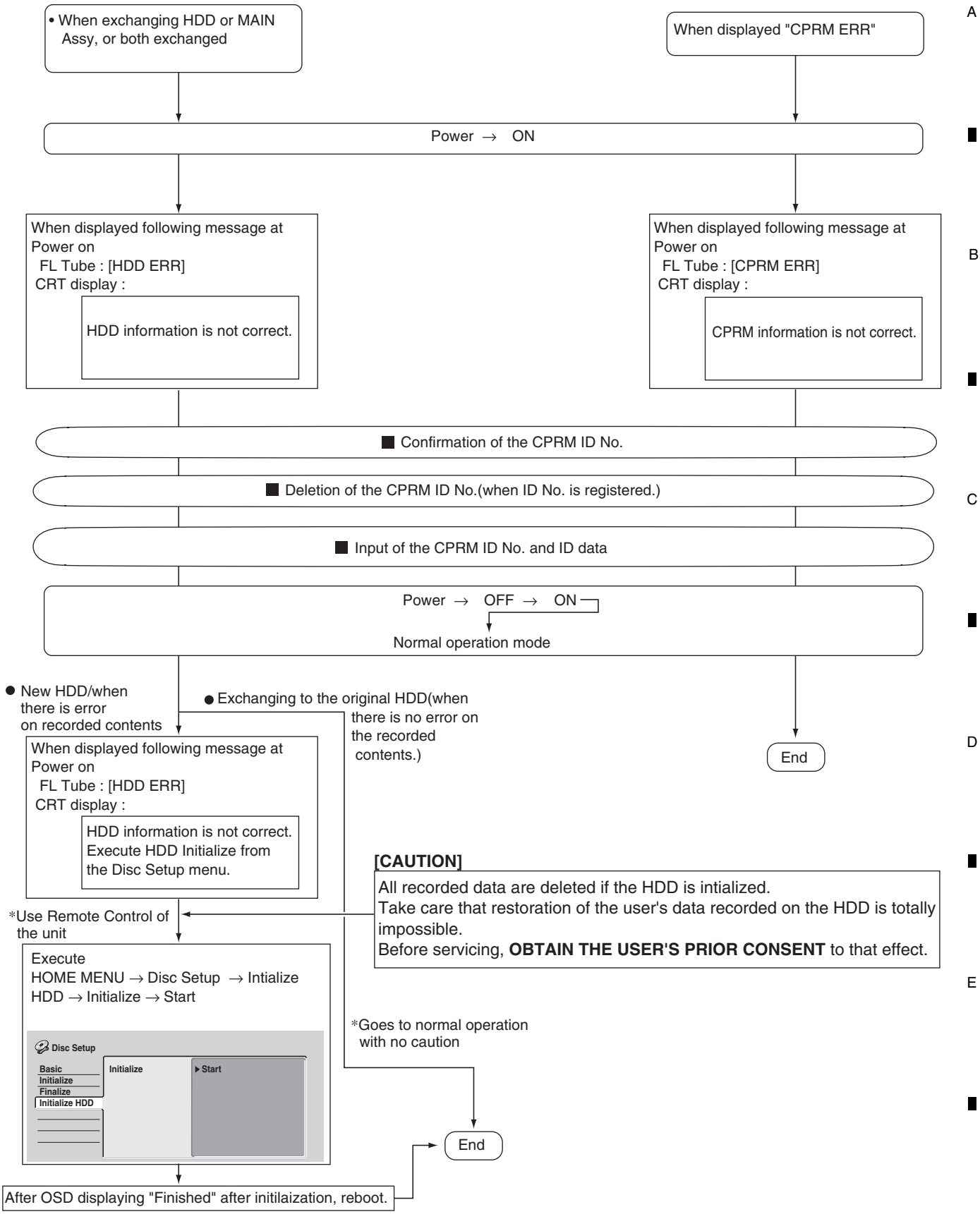
Be sure to use the latest disc (Type 2).
In May, 2006, the latest disc is GGV1273.

[Notes]

Important: If no ID label is found on the rear panel, write down the specified ID number by checking it according to "How to confirm the ID number" shown below.

- Input the ID number while the unit is in Stop mode.
- After the data are read from the data disc (Type 2), the disc will automatically be unloaded.

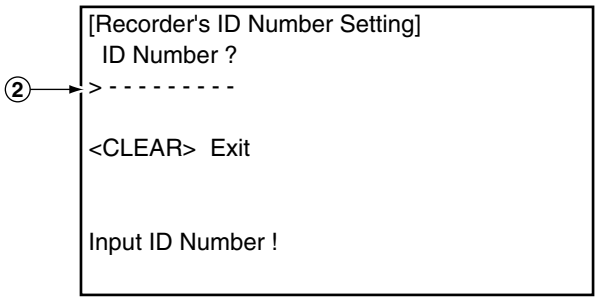
■ Input Flow of the ID No. and ID data when exchanging HDD or MAIN Assy


• When exchanging HDD or MAIN Assy, or both exchanged
When displayed "CPRM ERR"
Power → ON
When displayed following message at Power on
FL Tube : [HDD ERR]
CRT display :
HDD information is not correct.
When displayed following message at Power on
FL Tube : [CPRM ERR]
CRT display :
CPRM information is not correct.
■ Confirmation of the CPRM ID No.
■ Deletion of the CPRM ID No.(when ID No. is registered.)
■ Input of the CPRM ID No. and ID data
Power → OFF → ON
Normal operation mode
● New HDD/when there is error on recorded contents
● Exchanging to the original HDD(when there is no error on the recorded contents.)
End
When displayed following message at Power on
FL Tube : [HDD ERR]
CRT display :
HDD information is not correct.
Execute the Disc Setup menu.
[CAUTION]
All recorded data are deleted if the HDD is intialized.
Take care that restoration of the user's data recorded on the HDD is totally impossible.
Before servicing, OBTAIN THE USER'S PRIOR CONSENT to that effect.
*Use Remote Control of the unit
Execute
HOME MENU → Disc Setup → Intialize
HDD → Initialize → Start
*Goes to normal operation with no caution
Disc Setup
Basic
Initialize
Finalize
Initialize HDD
Initialize
Start
End
After OSD displaying "Finished" after initilaization, reboot.

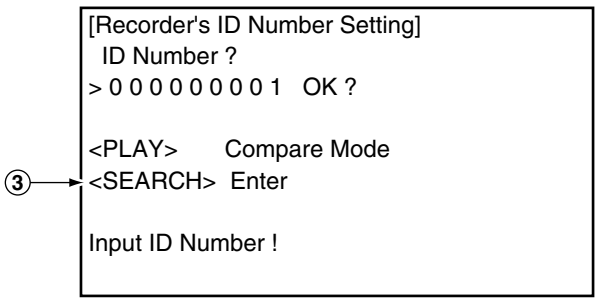
How to Input the ID Number and ID Data

① To enter the input mode, press ESC + STEREO keys sequentially in a status with no ID number set, such as after FLASH-ROM downloading.

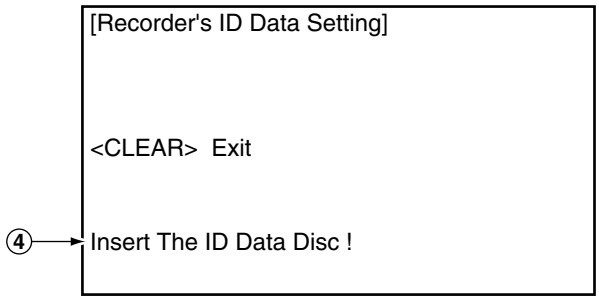
② As number input is enabled when the unit enters the input mode, input the 9-digit ID number.
(The entered number is also displayed on the FL display.)



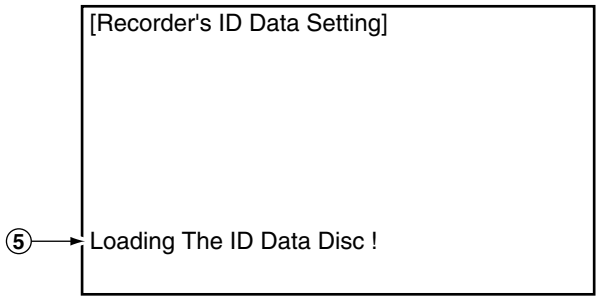
③ After inputting the number, press SEARCH keys to register the ID number.



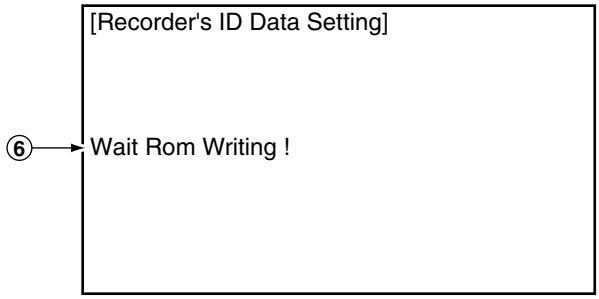
④ When the ID number has been registered, the unit enters the ID data input mode. (The FL display indicates "INSERT ID.")
In this condition, place the ID data disc on the tray and close the tray using the CLOSE key "■/⏏" on the player.



⑤ While the data are being read, the message shown in the figure at left is displayed on the screen.
(The FL display indicates "LOAD ID.")

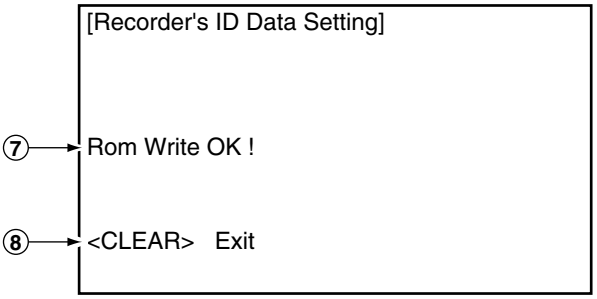


⑥ When the ID data have been read, the data are written to the FLASH-ROM.
(The FL display indicates "WRITE ID.")



⑦ When the ID data have been written to the FLASH-ROM, the message "Rom Write OK" is displayed on the screen.
(The FL display indicates "ID OK.")

⑧ After confirming this message, press CLEAR key to exit the input mode.

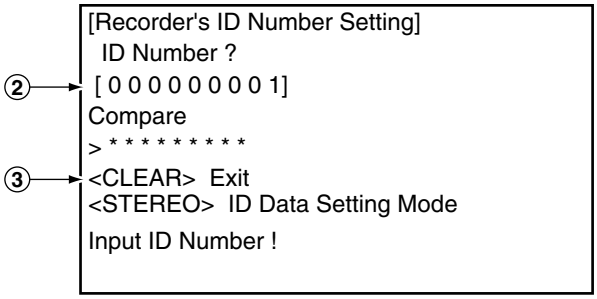


[How to Confirm the ID Number]

① Press ESC + STEREO keys sequentially with an ID number already set, and the unit enters the ID number confirmation mode.

② The set ID number is displayed on the screen (and on the FL display), permitting you to confirm it.

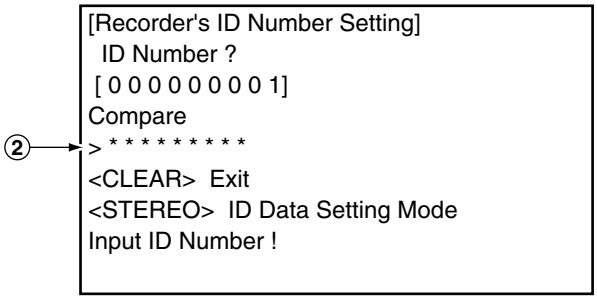
③ To exit this mode, press CLEAR key.



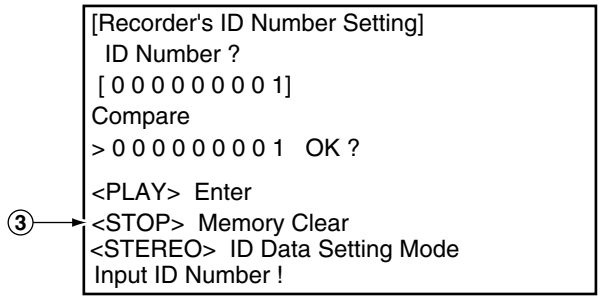
[How to Clear the ID Number]

① Press ESC + STEREO keys sequentially with an ID number already set, and the unit enters the ID number confirmation mode.

② Input the same number as the ID number you have set.



③ After inputting the number, press STOP key.
Only when the entered number matches the set ID number, the ID number is cleared and the unit exits this mode.
If the numbers do not match, you must return to step ②.
(STOP key is not accepted until 9 digits are entered.)



7.1.3 FIRMWARE DOWNLOADING METHOD

[Purposes]

1. When the main board is replaced, the firmware versions for the system control computer, drive, and the TUFL microcomputer do not match, and operations of the unit may be destabilized.
   To match the versions for the above four, firmware downloading is necessary in the following two cases:
   ① After the model setting
   ② When NG is displayed on the first screen (version information, etc.) of Service mode
   ③ After changing MAIN Assy or TUJB Assy

2. Rewriting the firmware to the latest version may ameliorate the symptoms claimed by the customer.

There are the following two methods for downloading: disc download and serial download

1. DISC DOWNLOAD

[Tools to be used]

Remote control unit for servicing (GGF1381)

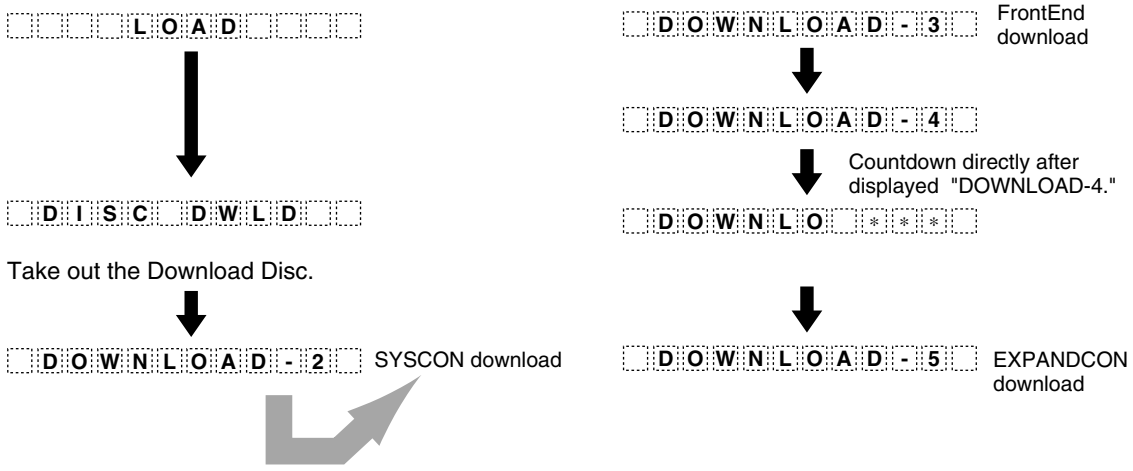
Download DISC

[Notes]

Be sure NOT to turn off the unit during downloading.
If the unit is turned off during downloading, the SYSCON, TUNERCON, DRIVE and IR Blaster programs may not be properly rewritten, in which case the unit may not be able to initialize itself normally when turned on again.

[Procedure] ① Open a disc tray by pressing the "OPEN/CLOSE" button.
② Put the download disc on the tray. Press a " OPEN/CLOSE " button while pressing a "Record Stop" button on the frontpanel.
* The disc tray closes automatically and the disc is loaded.
* The disc tray opens automatically after loading.

FL display



* After download is completed, the power turns off, and turns on and a disc tray closes automatically.
* It takes for about 7-8 minutes until download is completed.

④ Press and hold a " ESC " button, then press " DISP " button on the remote control unit for servicing.
⑤ Confirm a firmware release version.
⑥ Press " ESC " button on the remote control unit for servicing in order to exit the test mode.

[Tips]

(1) If the power is not correctly turned on or when the power is shut off during downloading, proceed as follows before performing download again:

- In a case where downloading was incorrectly terminated while "DOWNLOAD-2" was displayed on the FL display:
  The SYSCON program will not function correctly.
  If the program cannot be downloaded from the disc or through serial communication, replace the MAIN ASSY.

- In a case where downloading was incorrectly terminated while "DOWNLOAD-3" was displayed on the FL display:
  The DRIVE program will not function correctly.
  If the program cannot be downloaded from the disc or through serial communication, replace the MAIN Assy.

- In a case where downloading was incorrectly terminated while "DOWNLOAD-4" was displayed on the FL display
  The program for the tuner microcomputer will not function correctly.
  If the program cannot be downloaded from the disc, replace the TUNERCON microcomputer (IC101 : TUJB ASSY).

- In a case where downloading was incorrectly terminated while "DOWNLOAD-5" was displayed on the FL display
  The program for the EXPANDCON microcomputer will not function correctly.
  If the program cannot be downloaded from the disc, replace the EXPANDCON microcomputer (IC6001 : MAIN ASSY).

2. SERIAL DOWNLOAD

[Purposes]

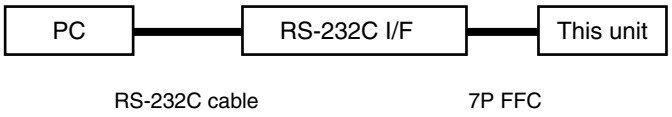
1. When the main board is replaced, the firmware versions for the system control computer, drive, and the TUFL microcomputer do not match, and operations of the unit may be destabilized. In such a case, the versions for the above three must be matched.
2. This method is used when disc downloading fails.

[Tools to be used]

* PC with serial port
* RS-232C straight cable
* RS-232C I/F jig (GGF1348)
* 7P FFC (VDA1681)
* Download program (UFU.exe)
* Firmware

[Connection]

Connect as follows:



[Procedures]

① Connect the 232C I/F jigs above way.

② Turn on the PC and start the " UFU.exe ".

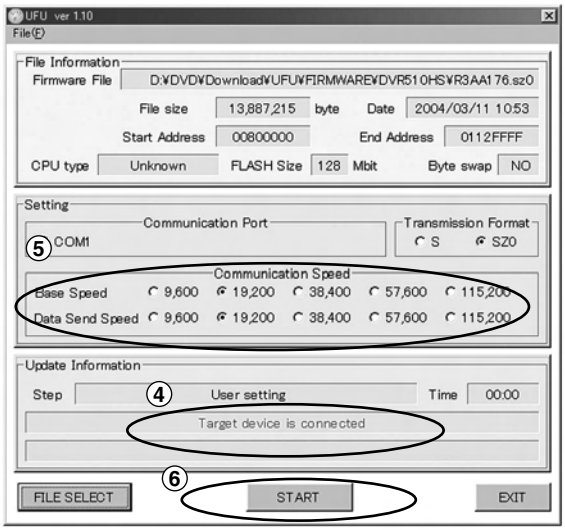
③ Select the Firmware file. ("sz0" file)

④ Turn the DVD recorder on and start the download program.
" Target Device is connected " is appeared on the screen.

⑤ Select the Communication Speed (Baud Rate)
a) Base Speed 115,200
b) Data Send Speed 115,200

⑥ START
- Even if you click "START" button, sometimes "Communication Error" may come out one to twice, and download may fail.
  In this case, please click "START" again.
- Other factors can be considerd if download fails 3 times or more.
- And it takes about 20 minutes for updating the firmware.

* TUNERCON and EXPANDCON program is not downloaded this way, so do disc-download for TUNERCON and EXPANDCON.

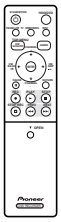


7.1.4 VIDEO ADJUSTMENT FOR SPECIFIC AREA

[Purposes]

Depending on the area, if a flicker may appear in a picture received by the tuner, it can be corrected or reduced with this setting.

[Tools to be used]



Remote control unit supplied with the unit (VXX3129)

Remote control unit for servicing (GGF1381)

1. Specific-Channel Setting mode

In this mode, specific settings can be made for up to 12 channels.
For channels that do not have specific settings, the settings of General Setting mode are applied.

[How to enter this mode]

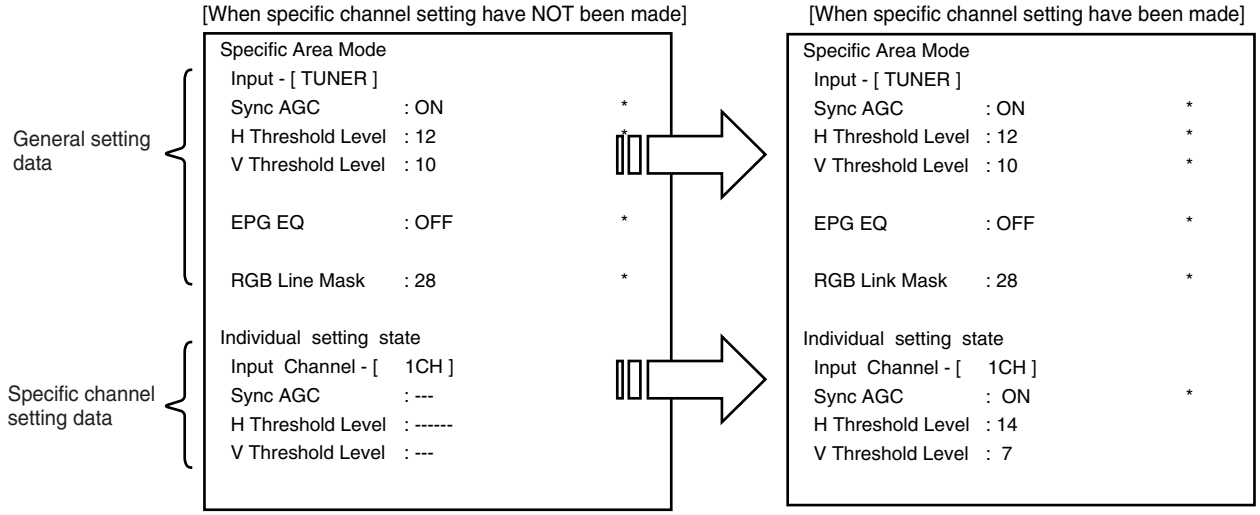
① Select a channel or line input (L1-L3) on which a specific setting is to be made.
② Press the ESC then CHP/TIM keys on the remote control unit for servicing. "General Setting mode" is displayed.
③ Press the DIG/ANA key in General Setting mode. Specific-Channel Setting mode is entered.

[How to exit] Press the ESC key on the remote control unit for servicing to return the Normal mode.

[Note] Setting is in effect only during recording/playback stop.

[Setting examples]

The setting examples in Specific-Channel Setting mode are shown below.
For details on each setting item, see "Table 1: Key operations in Specific-Area Setting mode."


[When specific channel setting have NOT been made]
[When specific channel setting have been made]
General setting data
Specific channel setting data
Specific Area Mode
Input - [TUNER]
Sync AGC : ON *
H Threshold Level : 12 *
V Threshold Level : 10 *
EPG EQ : OFF *
RGB Line Mask : 28 *
Individual setting state
Input Channel - [1CH]
Sync AGC : ---
H Threshold Level : ------
V Threshold Level : ---
Specific Area Mode
Input - [TUNER]
Sync AGC : ON *
H Threshold Level : 12 *
V Threshold Level : 10 *
EPG EQ : OFF *
RGB Link Mask : 28 *
Individual setting state
Input Channel - [1CH]
Sync AGC : ON *
H Threshold Level : 14
V Threshold Level : 7

[Tips]

- If a channel that does not have specific settings is displayed, the setting figures are displayed as hyphens (- -).
- If the setting figures are not displayed as hyphens, those settings have been specifically set even if they are identical to the default settings or those of General Setting mode.
- The setting indicated with an asterisk (*) is the default.
- The channels to be indicated for "Input Channel" are as shown below:
  Line inputs: L1-L3, DV (DV is not valid for specific-area settings.)
  Tuner channels: Channels received by the tuner (channels to be set in Specific-Channel Setting mode, etc.)

[Tips]

- Indication when the maximum number (12) of channels have individual settings
  If a channel that does not have specific settings is currently selected, the indication will be as shown below, and individual data items cannot be set for that channel. To set individual data items for the currently selected channel, you must clear any specific-channel settings for one or more channels.

```
Specific Area Mode
  Input - [ TUNER ]
  Sync AGC          : ON          *
  H Threshold Level : 12          *
  V Threshold Level : 10          *

  EPG EQ            : OFF         *

  RGB Line Mask     : 28          *

Individual  setting  state
  Sorry !
  You can store only 12 channels
  for Specific Area mode.
```

[H Threshold Level]
The slice level setting for the horizontal(H)-sync separation circuit can be changed. By your changing the slice level, horizontal sync disturbance may be ameliorated. Set the slice level to a value with which the least sync disturbance is seen.

[V Threshold Level]
The slice level setting for the vertical(V)-sync separation circuit can be changed. By your changing the slice level, vertical sync disturbance may be ameliorated. Set the slice level to a value with which the least sync disturbance is seen.

[Receiver sensitivity setting for an electronic program guide (EPG)]
The sensitivity when receiving an electronic program guide can be selected. Set the sensitivity to "High" only if reception is unstable.

2. General Setting mode

[How to enter this mode]

- To shift from Specific-Channel Setting mode:
  Each time the DIG/ANA key is pressed, Specific-Channel Setting mode and General Setting mode are alternately selected.

- To shift from Normal mode (recording/playback stop):
  Press the ESC then CHP/TIM keys.

[How to exit] Press the ESC key to return the normal mode.

[Setting examples]

Show setting example on the General Setting mode screen to the following.
Regarding setting of actual each item, refer to table 1 (key operations in specific-area setting mode).

[General Setting mode screen]

```
Specific Area Mode
  Input - [ TUNER ]
  Sync AGC          : ON          *
  H ThresholdLevel  : 12          *
  V Threshold Level : 10          *

  EPG EQ            : OFF         *

  RGB Line Mask     : 28          *
```

*: Setting is the default.

[Display in General Setting mode when the channel currently displayed has specific settings]

```
Specific Area Mode
  Input - [ TUNER ]
  Sync AGC          : ON          *
  H ThresholdLevel  : 12          *
  V Threshold Level : 10          *

  EPG EQ            : OFF         *

  RGB Line Mask     : 28          *

This channel is set up
  individually.
```

[Tips]

- General Setting mode can be entered only during recording/playback stop.
- The currently selected input mode (TUNER or LINE) is displayed for "Input."
- If L1, L2, L3, or DV is selected for input, general settings for the line input can be made (DV is not valid for specific-area settings), and if TUNER is selected, general settings for the tuner input can be made.

Table 1: key operations in specific-Area setting mode (1/2)
Key operations in Specific Area Setting mode of the remote control units are shown in the table below
(the keys are of the remote control unit for servicing unless otherwise stated):

Key	Operation	Switching (*: Default)	Remarks	Used in Specific-Channel Setting mode	Used in General Setting mode
[DIG/ANA]	Switches General setting mode and Specific setting mode.	–	–	○	○
[INPUT SELECT], [CHANNEL +/-] (Remote control unit supplied with this unit)	Switches inputs or channels.	–	–	○	○
[SIDE A], [SIDE B]	Sets SyncAGC.	ON(*) / OFF	ON : The sync level is set to an appropriate value. OFF : Cancel the Sync AGC.	○	○
[Rev ×3], [×3 Fwd]	Sets H Threshold.	0 – 15 (Default : 12)	[Rev ×3] : Decreasing 1 by 1 in the range 0 to 15. (Cyclic operation) [×3 Fwd] : Increasing 1 by 1 in the range 0 to 15. (Cyclic operation)	○	○
[Rev CHAPTER SKIP] [CHAPTER SKIP Fwd]	Sets V Threshold Level.	0 – 15 (Default : 10)	[Rev CHAPTER SKIP] : Decreasing 1 by 1 in the range 0 to 15. (Cyclic operation) [CHAPTER SKIP Fwd] : Increasing 1 by 1 in the range 0 to 15. (Cyclic operation)	○	○

Table 1: key operations in specific-Area setting mode (2/2)

Key	Operation	Switching (*: Default)	Remarks	Used in Specific-Channel Setting mode	Used in General Setting mode
[<<|| STILL STEP], [STILL STEP ||>>]	Sets Line Mask setting at RGB signal is inputted.	22 - 40 (Default: 28)	[<<|| STILL STEP] : Decreasing 1 by 1 in the range 22 to 40. (Cyclic operation) [STILL STEP ||>>] : Increasing 1 by 1 in the range 22 to 40. (Cyclic operation)	×	○
[PLAY]	All channels that have specific setting data will be canceled, and the specific data will be initialized.	–	The General Setting data will not be changed.	○	×
[CLEAR]	Specific-Channel Setting mode: If the currently selected channel has its specific setting, that setting will be canceled. (By canceling the specific setting for that channel, the number of remaining channels that can have specific settings will be increased by one.) General Setting mode: Settings of General Setting mode are initialized.	–	Specific-Channel Setting mode: All specific data are initialized. The General Setting data will not be changed. General Setting mode: All general setting data are reset to default. The specific setting data will not be changed (will be retained).	○	○
[PAUSE]	The specific-channel-setting data for the currently selected channel are reset to default.	–	The General Setting data will not be changed (will be retained).	○	×
[ESC]	To quit Setting mode for a specific area and clear the on-screen display.	–	–	○	○

Notes:
- Each key listed in Table 1 above is active only while the tuner is completely stopped.
- The setting values will not be reset to default even if resetting to the state at the time of shipment is performed.

7.1.5 SERVICE MODE

Overview and purposes

To be used to check the status of the product and to collect the information for failure diagnosis.
The following information to be used for servicing is displayed:
[1] First screen : Version, HDD information, etc.
[2] Second screen : ATA/ATAPI debug screen (Writer information)
[4] Fourth screen : VR-recording-related error logs

Each screen has sublevel screens.

[Note] After entering any Service mode screen, to shift to another Service mode screen, first quit that Service mode screen then enter another Service mode screen.

1. Version information, etc. (First screen)

[Purposes]

To check the versions of the system control computer, TUNER microcomputer, and firmware for the drive, simple measurement of the RF level for the U/V tuner, results of the simple error rate measuremen, HDD information, and OSD Filter setting

[Tools to be used]

Remote control unit for servicing (GGF1381)

Aluminum-coated test disc (GGV1025)

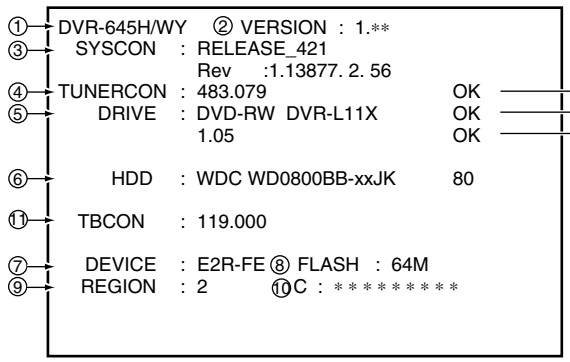
[How to enter] While the GUI screen is not displayed, press the ESC then DISP keys.

How to enter and change subscreens of the first screen: While the first screen is displayed, press the DIG/ANA key repeatedly until your desired subscreen is displayed. The subscreens change

[How to quit] Press the ESC key.

[Description]

(1) First screen


① DVR-645H/WY ② VERSION : 1.**
③ SYSCON : RELEASE_421
Rev :1.13877. 2. 56
④ TUNERCON : 483.079 OK
⑤ DRIVE : DVD-RW DVR-L11X OK
1.05 OK
⑥ HDD : WDC WD0800BB-xxJK 80
⑪ TBCON : 119.000
⑦ DEVICE : E2R-FE ⑧ FLASH : 64M
⑨ REGION : 2 ⑩C : **********

OK : Appropriate version compared with that of the firmware of the system control computer
NG- : The version of the TUNER microcomputer is older.
Measures to be taken:
• Download the firmware.

OK : The appropriate drive is mounted.
NG : An inappropriate drive is mounted.
Measures to be taken: Download the firmware.

OK : Appropriate version compared with that of the firmware of the system control computer
NG- : The version of the drive microcomputer is older.
Measures to be taken: Download the firmware.

① Model name/destination
② Version of the recorder software
③ Revision No. of the system-control computer software
④ Version No. of the tuner microcomputer
Result of the combination ckeck with system u-com
⑤ Information on the built-in drive
(Model name, version No., model type)
⑥ Data of the built-in HDD, capacity of the HDD
⑦ DEVICE information (EMMA type, ES No.)
⑧ FLASH ROM information
⑨ Region No.
⑩ CPRM information (CPRM key No.)
⑪ EXPANDCON information (Version)

• Details on HDD data are described below:

HDD : WDC10234564 # 160

- Capacity of the HDD (unit: Gbytes)
- HDD identification error indication
- Name of manufacturer, part No. by manufacturer

If any abnormality exists in HDD connection, the indications shown in Table 1 below are displayed.

Table 1: HDD recognition status represented by the HDD data display

HDD identification conditions	Example of HDD data to be displayed	Remarks
Failure in physical identification of HDD (no connection, defective HDD, interface error)	Blank space	• Check the connection to the ATA connector. • Replace the ATA flexible cable and connector. • Replace the HDD. • Replace the resistor in the ATA communication line.
Physical identification of HDD possible, but not identified (CPRM ID is not input.)	WDC 10234564 # 160	• Input the CPRM ID.
Physical identification of HDD possible, HDD identified, but failure in logical formatting	WDC 10234564 ! 160	"!" represents an HDD-recognition error. • Initialize the HDD or erase all titles.
Physical identification of HDD possible, HDD identified, and correct logical formatting (HDD correctly identified)	WDC 10234564 160	

If an error indication in the HDD data does not disappear even after the above measures were taken, refer to another sheet of "HDD Service Mode."

(2) Simple diagnosis of the RF level (Subscreen 1)

[Purposes] To check the RF signal of the U/V tuner by checking the input frequency difference and AGC voltage in this debug mode

[How to enter] While the User Setting display is displayed, press the ESC, DISP, then DIG/ANA keys, in that order.

[How to quit] Press the ESC key.

[Description]

```
DVR-645H/WY       VERSION : 1.**
  SYSCON   : RELEASE_***
             Rev    :1.******
TUNERCON   : 483.079                OK
   DRIVE   : DVD-RW DVR-L11X        OK
             1.05                   OK

     HDD   : WDC WD0800BB-xxJK      80

   TBCON   : 119.000

  DEVICE   : E2R-FE    FLASH : 64M
  REGION   : 2         C : *********

 Input CH  : ** ch      <-- Input channel
 Freq Diff : Low 1      <-- Input frequency difference
 AGC Volt  : **** mV    <-- AGC voltage
```

Subscreen 1

1) Frequency Difference (Freg Diff)

How much tuning is off is monitored, as shown below:

Input Frequency	Display
Faraway	High 7
High (within 200kHz)	High 1~5
Just Tune	Center
Low (within 200kHz)	Low 1~5
Low (over 200kHz)	Low 7

2) AGC voltage (AGC Volt)

The gain controlled by the tuner is monitored to infer the input electric field intensity.
(The accuracy of inference differs depending on the product.)

	Field Intensity	AGC VOL
Intense field area (Clear image)	70 dBµ or more	3100 mV or less
Less intense field area (Noise may be generated.)	50 dBµ or more 70 dBµ or less	3100 - 4400mV
Weak field area (Much noise. EPG/VPS/PDC sometimes cannot be obtained.)	30 dBµ or more 50 dBµ or less	4400 mV or more (It is unable to discriminate under the weak field area.)
Very weak field area (Image damaged. EPG/VPS/PDC cannot be obtained.)	30 dBµ or less	4400 mV or more (It is unable to discriminate.)

Tips:

For good reception, the field intensity must be 50 dBµ or more (AGC Volt 4400 mV or less).
For accurate measurement, use a field intensity meter.

(3) Simple Error Rate Measurement (Subscreen 2)

[How to enter]
- While the User Operation screen is displayed, press the [ESC] then [DISP] keys, then the [DIG/ANA] key twice, in that order.
- While subscreen 1 of the first screen is displayed, press the [DIG/ANA] key.

[How to quit] Press the [ESC] key.

[Measurement procedures]

① Display subscreen 2.
② Load the Test disc (GGV1025).
③ Judge the results of the error rate measurement by referring to Table 1 on page 89.

ERR RATE : *.*e-*

Subscreen 2

[Tips]

During VR mode playback, the average value of the past 10 VOBUs is displayed. During DVD-Video or Video mode playback, the average value of the past 256 sectors is displayed.
During VR mode playback, the speed ratio of the drive (/: normal, no indication: double speed) is also displayed.

Table 1: Thresholds when determining OK or Error

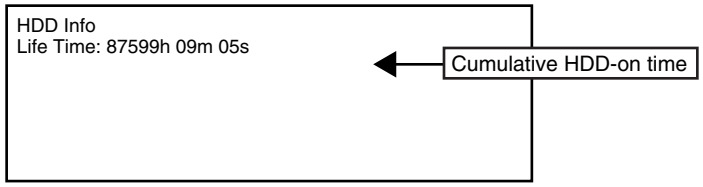
Disc type	Recording mode	Finalized or not finalized	Reference value
DVD-VIDEO	–	–	8.0×10^{-4}
DVD-R	Video mode	Finalized	1.0×10^{-3}
		Not finalized	1.0×10^{-3}
DVD-RW	Video mode	Finalized	1.0×10^{-3}
		Not finalized	1.0×10^{-3}

(4) HDD information (Subscreen 3)

[How to enter]
- While the User Operation screen is displayed, press the ESC then DISP keys, then the DIG/ANA key three times, in that order.
- While subscreen 2 of the first screen is displayed, press the DIG/ANA key.

[How to quit] Press the ESC key.

[Mode description]



Subscreen 3

[Tips]

- **How the data on cumulative HDD-on time are processed in memory**

  Storage place:
  FLASH ROM

  Timing of referring to the data on cumulative HDD-on time:
  When the power is turned on, fails, the FLASH ROM is referred to.

  Timing of updating the data on cumulative HDD-on time:
  While the HDD is on, the data on cumulative HDD-on time in the RAM is updated every 3 seconds, and every time updating is executed the data are stored in the Backup SRAM. When the power is turned off, the data are stored in the FLASH ROM.

- **How to clear the data on cumulative HDD-on time**

  FLASH ROM:
  When the HDD Identification Setting is performed, the data on cumulative HDD-on time are automatically cleared. The HDD Identification Setting is automatically performed when the CPRM setting is performed on the CPRM setting screen (to display the CPRM setting screen, press the ESC then the STEREO keys).

  Notes:
  - The data on cumulative HDD-on time are not cleared when resetting to factory-preset values is performed.
  - The data on cumulative HDD-on time are not cleared when the system-control computer software is downloaded.

(5) OSD FILTER SETTING (SUB screen 4)

[Purpose] Depending on the monitor used, the character flicker on the OSD may stand out.
If a system, such as charavter flicker, appears on the monitor, select the filter response.

[Tools to be used]

Remote control unit for servicing
(GGF1381)

[How to enter]
- While the User Operation screen is displayed, press the ESC then DISP keys, then the DIG/ANA key four times, in that order.
- While subscreen 3 of the first screen is displayed, press the DIG/ANA key.

[How to quit] Press the ESC key.

[Setting procedures]

① Display subscreen 4.
② Select the setting from the key operation table.

OSD Filter Setting

OSD FILTER : 4

Subscreen 4

[Tips]

As the setting value becomes greater, jitter is reduced on a CRT display. However, as lines for characters appear thick, complex characters may become difficult to read. On the contrary, as the setting value becomes smaller, jitter increases on a CRT display. However, as lines for characters become sharper, complex characters become more legible.

Note: Use the remote control unit for servicing.
Note: A new setting becomes active as soon as it is made. As a new setting is stored in nonvolatile memory, it will be retrieved when the unit it turned on the next time.
Note: After the factory-preset values are downloaded, the setting value for the OSD Filter will be the default value (4).

[(Table 2) Key operation of OSD Filter setting]

Key	Operation	Setting value	Remarks
[Rev x 3], [SPEED+] [x 3 Fwd], [SPEED-]	Changing the setting value for the OSD Filter	0 - 4 (Default value: 4)	[Rev x 3], [SPEED+] : The setting value increases by 1. [x 3 Fwd], [SPEED-] : The setting value decreases by 1.
[CLEAR]	The setting value is reset to default.	–	
[ESC]	To exit the OSD Filter Setting and clear the screen (Appears the tuner screen.)	–	–

2. ATA/ATAPI Debug Screen (Second screen)

[Purposes]

To be used as a rough guide to judge whether the pickup unit is all right or not

- Dirt on the pickup lens
- Degradation of the laser diodes for reading CDs and reading/writing to/from DVDs

[Tools to be used]

Remote control unit for servicing (GGF1381)

Aluminum-coated test disc (GGV1025)

[How to enter]

- While the User Operation display is displayed, press the ESC, DISP, then 2 keys, in that order.
- While any subscreen of the second screen is displayed, press the DIG/ANA key repeatedly. The subscreens change cyclically.

[How to quit] Press the ESC key.

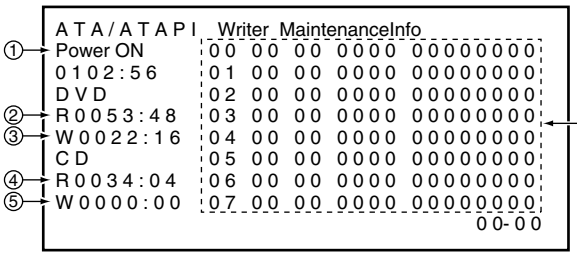
(1) Writer maintenance information of ATA/ATAPI DEBUG OSD (Subscreen 3)

[How to enter]

- While the User Operation screen is displayed, press the ESC, DISP then 2 keys, then the DIG/ANA key twice, in that order.

[How to quit] Press the ESC key.

[Procedures] Update the display by pressing the SEARCH key while subscreen 3 is displayed.



Error log for the Writer (Not for Service)

① Power-on time/cumulative power-on time
② Duration of emission of the laser diode (LD) for DVD-R/DVD while reading
③ Duration of emission of the LD for DVD-W/DVD while writing
④ Duration of emission of the LD for CD-R/CD while reading
⑤ Duration of emission of the LD for CD-W/CD while writing (This function is not used for this model.)

② If the total hours of duration of emission of the laser diode (LD) for DVDs while reading ② and that of emission of the LD for DVDs while writing ③ exceed 4,700 hours, the LDs may be degraded. Perform an LD degradation judgment, using subscreen 4.

[Tips]

MTTF hours for each LD
DVD: 4,700 hours
CD: 11,000 hours
The ATA/ATAPI Writer Maintenance Info is obtained each time the power is turned on. Thereafter, the data on the subscreen is updated each time the SEARCH key is pressed (the updating command is sent) while this subscreen is displayed. Care must be taken when updating this subscreen, because an undesired command is inserted if it is executed while recording, etc.
[Note on lighting time data for each LD]
Since data on lighting time of each laser diode (LD) are stored in the flash ROM on the MAIN Assy, after the MAIN Assy is replaced, the data will be cleared. However, after the LOADER Assy is replaced, data on lighting time of each LD will be retained in the MAIN Assy. Therefore, before either the MAIN Assy or LOADER Assy is to be replaced, it is recommended that you write down the lighting time data.

(2) LD degration judgment of ATA/ATAPI DEBUG OSD (Subscreen 4)

[How to enter]
- While the User Operation screen is displayed, press the ESC, DISP then 2 keys, then the DIG/ANA key three times, in that order.

[How to quit] Press the ESC key.

[Notes]
- For correct measurement of items ① to ④ indicated in the display below, leave the unit at room temperature (25°C) for a while before turning it on, and do not load a disc.
- For RF measurement (item ⑤), it is recommended to use the Test disc (GGV1025).
  As the RF level differs depending on the characteristics of the pickup from product to product, it cannot be used for judging degradation of the LD. Use the RF level as a rough guide to know the difference between before and after lens cleaning.

[Procedures] To update the value for each item, press the SEARCH key while subscreen 4 is displayed.
For details on each item and the conditions of updating the values, see Table 2 below.

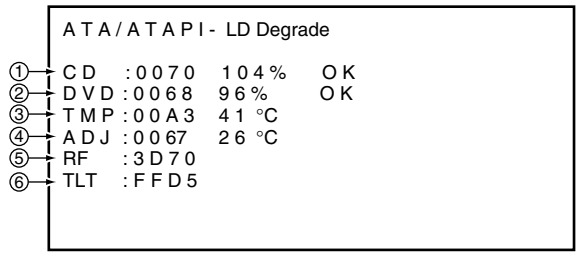


Table 2: Description of each item and conditions for updating data

No.	Item	Description	Conditions for updating by pressing the SEARCH key
①	CD	Degradation judgment of LD for CD. Regarded as NG when the value is 120% or higher (same standard as for the PC drive)	No disc inserted in the disc tray
②	DVD	Degradation judgment of LD for DVD. Regarded as NG when the value is 120% or higher (same standard as for the PC drive)	No disc inserted in the disc tray
③	TMP	Current temperature inside the Writer	No disc inserted in the disc tray
④	ADJ	Temperature (approx. 25°C) inside the Writer during adjustment	No disc inserted in the disc tray
⑤	RF	RF level (16-bit data, proportional calculation performed using the actual RF level value with 2.5 V = 0xFFFF as the maximum value, displayed in 4-digit hexadecimal)	During playback of disc medium (GGV1025)
⑥	TLT	Writer adjustment data for straight (non-HDD) model (FFFF is diplayed when the writer is not adjusted.)	No condition

If the results of degradation of the LDs for CDs and DVDs are both NG, replace the drive.

3. VR-Recording-Related Error Logs (Fourth screen)

[Purposes]

To roughly determine in which category shown below a symptom that is difficult to reproduce belongs.
For details on the categories of error logs displayed, see "Table 1: Description of VR-recording-related errors."

- Errors related to the MPEG Encoder
- Errors related to the drive system
- Errors related to copying
- Errors related to others
- Errors related to the HDD

[Tool to be used]

Remote control unit for servicing
(GGF1381)

[How to enter]

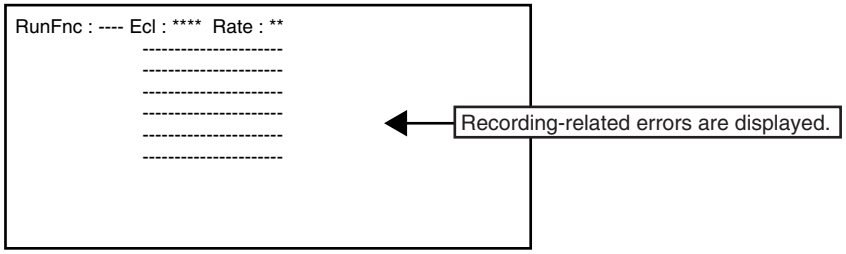
- While the User Operation display is displayed, press the [ESC], [DISP], then [4] keys, in that order.
- While any subscreen of the fourth screen is displayed, press the [DIG/ANA] key repeatedly.
  The subscreens change cyclically.

[How to quit] Press the [ESC] key.

[Description of each subscreen]

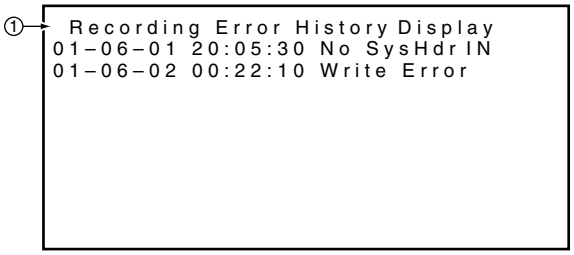
(1) VR-Recording-Related Error Logs (Subscreen 1)

- Errors related to recording are displayed on the lines "Rec Err:," as shown below.
  For details on errors, see "Table 1: Description of VR-recording-related errors."



(2) Subscreen 2 and 3 (These subscreens are not for service use.)

(3) VR-Recording-Related Error Logs (Subscreen 4)



① There are two error-log screens, on which up to 9 logs per screen are displayed.
(generation time [year-month-day, hour:minute:second], error data in simplified description)

[Tips]

- The two error-log screens can be switched by pressing the [SPEED+] or [SPEED-] key.
- For details on error messages, see Table 1 "Description of VR-recording-related errors".

(4) Subscreen 5 to 11 (These subscreens are not for service use.)

Table 1: Description of VR-recording-related errors

Any error message marked with * is displayed "RecErr : ---------" on the Subscreen 1 of the fourth screen.

● Error related to MPEG Encoder

Error Message	Description
AVEnc Hang	AVEncoder failed
IN Encode *	Changes cannot be made in the process of encoding
No SysHdr IN	System packet is not input periodically
Stm Start NG	Failure to start encoding (reasons not clear)
Stream NG	Inappropriate input stream data
Strm Start NG	Timeout waiting for system packet input at the beginning

● Error related to Drive system

In a case of an error in the drive system, scratches or dirt on a disc, or a problem of the drive itself (dirty pickup) may be suspected.

Error Message	Description
Bdr Cls NG	Close Border failed
Bdr Opn NG	Open Border failed
BUF Overflow	Overflow of the Stream Buffer
CLS Rzon Fail	Video Mode Close Rzone failure
Drive Hang	The Drive is hung up.
Drv Err	General error of the drive
Drv Hard Err	Abnormality in the drive hardware or firmware
Drv TimeOut	Timeout waiting for drive operation
Fail Repair	Repair failed
Format NG	Format failed
May Be V mode	Although TMP_VMGI is not written, it may be Video Mode disc.
Mech No Res	No response from the mechanical-control computer
MKB Invalid	MKB reading error
NWA Exhaust	NWA surpassed and impossible to use
OPC NG	OPC failed
PCA Full	PCA has been used up.
Read Err	Reading failed, ECC failed, etc.
ReadOnly DISC *	Because some data are invalid, data cannot be written
RMA Full	RMA has been used up.
Rzn Cls NG	Close RZone failed
Rzn Rpr NG	Repair RZone failed
Rzn Rsv NG	Reserve RZone failed
TMP-VMG WrErr	Video Mode TMP VMGI Write Error
VTSI_B Wr Err	Video Mode VTSI BUP Write Error
VTSI_B2 Wr Err	Video Mode VTSI BUP Write Error (After Layer Change)
VTSI Wr Err	Video Mode VTSI Write Error
VTSI2 Wr Err	Video Mode VTSI Write Error (After Layer Change)
Write Err	The Drive failed to write and could not be recovered.
May Be PVR	May be +VR disc, but no RSAT
V Final fail	Abnormal process occurred when finalizing Video mode
DLVR trace NG	Close Rzone failed at dual layer disc

RSAT : Reserved Space Allocation Table

● Error related to Dubbing

Error Message	Description
H2D CP SomeNG	Other NG HDD →DVD copy
Mem get NG	Video Mode Copy Memory has not ensured.
Strm TransfNG	Video Mode Copy Stream Transfer NG
Tracon Trn NG	Video Mode Copy Tracon tranfer has not been completed.
VC Cell Max	Maximum number for Video Mode copy Cells exceeded
VC CopyCancel	Video Mode Copy Copy Cancel
VC FlushC NG	Video Mode Copy Flush Cache NG
VC HDD C Err	Obtaining Video Mode Copy HDD Cell information failed
VC HDD Inf NG	No information on Video Mode Copy HDD
VC HDD Info NG	Format failed
VC Idling NG	Video Mode Copy idling NG
VC Pck Anl NG	Analizing Video Mode Copy Pack failed

● Error related to Dubbing (continued)

Error Message	Description
VC Transf Stp	Video Mode Copy Transfer Stop
VC TSO BLK NG	Video Mode Copy TSO Block transfer has not been completed.
VC VOBU SizeE	Video Mode Copy VOBU Size NG
V Rsv RzoneNG	Video Mode Copy Reserve Rzone failed
V2H APP FL NG	VR → HDD APP FLG is OFF
V2H Aud Ch NG	VR →HDD Audio Channel NG
V2H Aud Md NG	VR →HDD Audio Mode NG
V2H Aud Stm N	VR →HDD Audio Stream number NG
V2H SRC Prot	VR →HDD copy prohibitted material
V2H Unknown	VR →HDD other NG
V2H VOBU TMNG	VR →HDD Play back time of each VOBU is different
V2H V Reso NG	VR →HDD Video resolution NG
H2D CP NoSpac	HDD →DVD insufficient free space for copy
H2D TO HDDRD	HDD →DVD (VR) TimeOut at HDD playing side
H2D TO SPRO	HDD →DVD (VR) TimeOut at internal processing
H2D TO DVDWR	HDD →DVD (VR) TimeOut at HDD recording side

● Other Errors

Error Message	Description
Abort *	Cancellation
Already open	Extension file is already opened.
BK BATT Down	Backup RAM data has been erased.
BK FSYS Dirty	Backup RAM data has not been wrtten on the File Sys.
BUG	Some bugs
BusReset Done	Bus Reset has been excecuted.
Cell Close NG	Cell Close NG
CPRM IC NG	Inappropriate CPRM IC
Dir Depth Err	Tree of Directory is too deep.
Disc Full	No further data can be written because the disc is full.
DRAM CLR Err	Video Mode DRAM (Stream Buffer) Clear failure
DRAM NG	Abnormality in access to the Work DRAM
Drive Destroy	The drive has crashed.
EncModul Hang	Encoder routine is hung up.
F Alrdy Exst	Extension file is already exist.
File cansel	Extension file is canseled.
FileNot Exist	Extension file is not exist.
Format Excec	Formatting has been executed.
Invalid Disc *	The disc cannot be recognized.
Invalid Param *	Invalid parameter
Invalid TMVMG	Invalid TMP_VMGI content
Invalid UDF *	Invalid UDF content
Invalid VMG *	Invalid VMG content
Invalid VTSI	VTSI information of +VR is unusual.
Irr Action *	Incorrect action
MKB REVOKED	Error in gaining data
Limit Over *	Standard maximum limit exceeded
No More Info *	No more space in the internal work-management area
No Permission *	No permission to write to the disc
No Video	No video input (not locked)
Now Busy *	In the process of the emergency processing
NV Pck DMA Er	Inappropriate NaviPack DMA
NV Pck MK Err	Error in creating NaviPack
Ourob Strm NG	Inappropriate stream data to the Ouroboros input
Over Heat	Abnormal temperatute
PARAM NO ACCP	Recording parameter is not matched.
Process Over	Process is overfull.
Protect Src *	Source to be recorded is copy-protected.
Rec Pause *	No operation permitted during recording pause
Relocation Do	VR-recording data was relocated

● Other Errors (continued)

Error Message	Description
Repair Excec	Repairing has been executed.
Something *	Undetermined error
SRAM NG	Abnormality in access to the backup work SRAM
Status NG *	Abnormality in change of statuses
SW PVR	Switch to +VR playback process
SW Vpb mode *	Switching to video playback routine is required.
SW Vrec mode *	Switching to video recording routine is required.
Unmatch Stamp *	Impossible to modify because of nonmatching time stamp
VBR-SRAM NG	Abnormality in VBR SRAM
V Categ ID NG	Inappropriate Category ID
V Cate Inf NG	Inappropriate Category information
V Ext MAX Ovr	Count Max exceeded
V ExtToo Big	The extension file is too large.
V Ext TY NG	Type NG
Virgin DISC	Virgin Disc
VOBU Info NG	Inappropriate VOBU information
WaterMark Det	Watermark detected
WM Cracked	WM Cracked
Param Short	Editting Error (Clear A-B)
Invalid VRMI	Information of +VR is NG. (VRMI)

● Error related to HDD

Error Message	Description
Do nothing	Do nothing for demand.
ESFSYS CORUPT	easyfsys error
ESFSYS INIT	easyfsys initializing
HDD Buff High	High-level process executed for the HDD Buffer
HDD DEF DONE	HDD deflag finished
HDD DEF ERR	HDD deflag error
HDD Destroy	HDD is not recognized on the bus.
HDD INFO BAD	Incorrect HDD Management Data
HDD Initialize	HDD initialized
HDD IRRG POFF	Abnormal power off
HDD MBR NG	Inconsistent MBR data
HDDReset Done	HDD Reset executed
HDD ROMSUM NG	Rom-code check sum NG
HDD SIG NG	Inconsistent HDD Management Data Magic
HDD SMART NG	Inappropriate HDD SMART
HDD Trans Err	DMA error in HDD copy transfer
HDD unauthor	Inconsistent HDD serial No.
HDD Zero WR	MBR was witten
Task No Activ	Task has not been activated.
TT Rec Over	Title recording time full
HDD WRONG TGT	Invalid HDD target No. is directed.
extHDD Ignore	External HDD is dismounted.
HDD PFile NG	Program file installed in HDD is NG.
HDD DEL TT	Delete the title by HDD recovery.
HDD DEL PL	Delete the dubbing list by HDD recovery.
HDD DEL OC TT	Delete the title moving on the way inside HDD

● No Error

Error Message	Description
Non Err *	Normal

Abbreviations:

ECC = 4 byte Code for Error Correction
UDF = Universal Disc Format
PCA = Power Calibration Area
OPC = Optical Power Control
NWA = Next Writable Address
VMG = Video Manager
RMA = Recording Management Area
MKB = Media Key Block
TMP_VMGI = Temporary Video Manager Information
Border = from Lead-in to Lead-out

7.1.6 DV SERVICE MODE

1. DV debug

[Purpose]

To check whether communication between a DV device and the unit is normal when a DV device is connected

[Tools to be used]

Remote control unit for servicing (GGF1381)

- DV device
- DV cable

[How to enter] Press the ESC , DISP then 3 keys, in that order.

[How to quit] Press the ESC key.

[Mode description]

① **(DV/1394) InitDV:**OK **InitVE:**OK **AV**:02 **DV**:01

② [**Recorder**] **GUID:**00E0360006100001 IRM
③ **iPCR**:C03F0000 **oPCR**:0000007A
④ [**DV**] **GUID:**0080880303480E96
⑤ **VN:**VICTOR **MN:**GR-D50K
⑥ **TM:**C3 **TS:**75 **CT:**32 **WP:**01 **PS:**FF **OS**:00
⑦ **CA:**A000002020 **CV:**FF **MD:**VTR
⑧ [**DVdecode:**Yes] **LineSys:**525-60
⑨ **TC:**00h20m35s **RD:**02/02/05 **RT:**10h34m50s
⑩ **ASPECT:**4:3 **CGMS:**000000 **APSTB:**00 **DEC:**525-60
⑪ **SF:**32KHz **QU:**12bit **AMODE:**4) Stereo

Boldface alphanumerics : Fixed indications
Nonboldface alphanumerics : Variable indications

No.	Item	Description	Remarks
①	InitDV	Whether the initialization of UPD72893B(1394 LINK and DV codec IC) has been completed (OK) or not (NG)	If NG is displayed, it is considerd the communication failure to UPD72893B. (Note 1)
	InitVE	Whether the initialization of ADV7172 (Video Encoder for DV specific) has been completed (OK) or not (NG)	If NG is displayed, it is considerd the communication failure to ADV7172. (Note 2)
	AV	Number of AV devices recognizing connection	Identification number of AV devices including D-VHS, Digital Tuner, etc other than DV devices.
	DV	Number of DV devices recognizing connection	If the number does not become 01 even if a DV device is connected, identification of that device fails.
②	GUID	GUID set in ConfigROM of the unit	GUID : Global Unique ID (Specific ID for DV devices) If the unit is ROOT (IRM), IRM is displayed at the side position of GUID display.

Note 1 : NG shall be displayed excluding "Copy from a DV source", "DV Video Playback" and "DV Video Settings" mode, because UPD72893 is being reset excluding those mode.

Note 2 : NG shall be displayed excluding "Copy from a DV source", "DV Video Playback" and "DV Video Settings" mode, because ADV7172 is being reset excluding those mode.

No.	Item	Description	Remarks
③	iPCR	iPCR value of the unit	
	oPCR	oPCR value of the unit	
④	GUID	GUID set in ConfigROM of the connected DV device	Data are displayed only if one DV device is identified. If the connectd DV device is ROOT (IRM), IRM is displayed at the side position of GUID display.
⑤	VN	Vendor name set in ConfigROM of the connected DV device	Data are displayed only if one DV device is identified. (Depending on the device, the vendor name may not be set in ConfigROM.)
	MN	Model name set in ConfigROM of the connected DV device	Data are displayed only if one DV device is identified. (Depending on the device, the model name may not be set in ConfigROM.)
⑥	TM	Transport Mode data obtained from the DV device	Data are displayed only if one DV device is identified.
	TS	Transport State data obtained from the DV device	
	CT	Cassette Type data obtained from the DV device	
	WP	Write-protection data obtained from the DV device	
	PS	Power-state data obtained from the DV device	
	OS	Output signal mode data obtained from the DV device	
⑦	CA	Connect AV data obtained from the DV device	Data are displayed only if one DV device is identified.
	CV	Camera/Vtr mode data obtained from the DV device	
	MD	DV device mode	Camera or VTR is displayed only if one DV device is identified.
⑧	[DVdecode:XXX]	Whether Yes (in the process of requesting DV input) or No is indicated in XXX	Normally, Yes is indicated only when CH is set to DV.
	LineSys	Input Line System setting	
⑨	TC	Time-code data of the DVdecode Stream, or response data of the Time Code command	Stream time-code data are obtained when the tape is played in forward direction. Otherwise, time-code data are obtained through an AV/C command.
	RD	Rec Date of DVdecode Stream	
	RT	Rec Time of DVdecode Stream	
⑩	ASPECT	Aspect Ratio of DVdecode Stream	
	CGMS	CGMS of DVdecode Stream (from left to right, CGMS data of bits 5-4: Audio ch 2, bits 3-2: Audio ch 1, and bits 1-0: Video)	*CGMS (Copy Generation Management System): The two-digit codes added to broadcast programs represent the following: 00: Copy freely, 10: Once copy, 11: Never copy
	APSTB	APS trigger bit of DVdecode stream	
	DEC	With/without DVdecode stream input	With input: Signal type (525-60, 625-50, 1125-60, 1250-50, or Invalid) is indicated, Without input: "No" is indicated.
⑪	SF	Sampling Frequency of DVdecode Stream	If SF is 44 kHz, it is considered that 44.1-kHz audio is input, and sound is muted on the unit.
	QU	QUANTIZATION of DVdecode Stream	
	AMODE	AUDIO MODE of DVdecode Stream	

2. Simple Diagnosis of DV

Symptoms		Location in the Debug Screen	Items to be Checked, and Conditions	Possible causes
No operation for DV input	1	DV ①	Check the initDV indication: OK: Initialization of DV related LSI (IC102, IC108) appropriately completed. NG: Initialization of DV related LSI (IC102, IC108) has not been completed properly. Defective communication with DV related LSI (IC102, IC108) and Host u-com (IC1001) (Note 1)	Defective IC102(1394Link & DVcodec)/ IC108(1394PHY), improper connection between IC102 / IC108, defective soldering, defective power supply, etc.
	2	DV ①	Check the number of DV devices when one DV device is connected to the recorder: 01 : The connected DV device is correctly identified. Other than 01 : The connected DV device is not correctly identified.	Defective DV terminals, improper connection of the DV-terminal board, defective IC108(1394PHY), defective cables, an IEEE 1394 device other than the DV device connected.
No picture nor sound for DV input	1	DV ⑧	Check of DV decoding when the recorder channel is set to DV: Yes: The recorder is in the process of a DV input operation No: The recorder is not executing a DV input operation	Defective IC102(1394Link & DVcodec), defective soldering, defective power supply, etc.
	2	DV ⑩	Check DEC: 525-60: An NTSC DV signal is input from the DV device. 625-50: A PAL DV signal is input from the DV device. No: No DV signal is input from the DV device.	Defective DV terminals, improper connection of the DV-terminal board, defective source device defective IC102(1394Link & DVcodec), IC108(1394PHY) **Note:** As to a model having the Input Line System setting, if the setting and the actual input signal system do not match, no picture appears.
DV input recording impossible	1	DV ⑩	Check CGMS:	Recording cannot be performed for a copy-protected source.
No sound for DV input	1	DV ⑪	Check SF: 32 khz: An audio signal with 32-kHz sampling frequency is being input. 48 khz: An audio signal with 48-kHz sampling frequency is being input. 44 khz: An audio signal with 44.1-kHz sampling frequency is being input.	An audio signal with 44.1-kHz sampling frequency is muted.
No picture for DV input	1	DV ①	Check the initVE indication: OK: Initialization of DV specific VideoEncoder (IC101) appropriately completed. NG: Defective communication with DV specific VideoEncoder (IC101) and HOST u-com (IC1001). Initialization of DV specific VideoEncoder (IC101) has not been completed properly. (Note 2)	Defective IC101(DV specific VideoEncoder), defective soldering, defective power supply, etc.

Note 1 : NG shall be displayed excluding "Copy from a DV source", "DV Video Playback" and "DV Video Settings" mode, because DV related LSI (IC102, IC108) are being reset excluding those mode.

Note 2 : NG shall be displayed excluding "Copy from a DV source", "DV Video Playback" and "DV Video Settings" mode, because DV specific Video Encoder (IC101) is being reset excluding those mode.

7.1.7 EPG SERVICE MODE

[Purposes]

Reasons for the following malfunctions can be inferred by checking the conditions for obtaining the past EPG data:

① EPG data cannot be obtained.
② Some EPG data obtained are missing.

[Tool to be used]

Remote control unit for servicing
(GGF1381)

[How to enter] • Press the [ESC], [DISP], [7] keys, in that order.

[How to quit] Press the [ESC] key.

[Description of the mode]

1. Summary screen

```
    0         1         2         3         4
    01234567890123456789012345678901234567890123456789
00  (EPG EURO)
01  Next Data  Download Time : 14:00
02             Duration     : 01h30m
03  Gemster Data  Fail Count  : 00
04
05
06
07  EPG Data Receive Err Summary
08  Date  Start  End   MD  CH  RcvPkt   TotalErr
09  03/31 13:00 13:30 DL  03  001853   000000
10  03/31 09:00 11:00 DL  03  001192   000000
11  03/31 08:00 08:05 HS  --  000645   000000
12  03/31 00:00 00:00           000000   000000
13  03/31 00:00 00:00           000000   000000
14  03/31 00:00 00:00           000000   000000
```

Lines 01-02	The next download starting time for the EPG data is displayed. Next Data Download Time: Starting time Duration: Duration required for acquiring the EPG data
Lines 03	The Gemster EPG data cannot be found. Number times of Host Scan and Schedule Download, DT models only (Always 00 except DT model)
Lines 09-14	The 6 latest error logs when EPG data were received are displayed, with the latest one at the top.

Date	: Month/day when reception started
Start	: Time when reception started
End	: Time when reception ended
MD	: Method for acquiring the EPG data (HS: Host scanning process, DL: Downloading process of the EPG data)
CH	: Data-receiving channel
RcvPkt	: Total number of received packages. A number 999,999 or greater is displayed as "999999."
Total Err	: Total errors during reception. The sum of Hamming Err, Trans Err and InvLine Err numbers indicated on the Detail screen. A number 999,999 or greater is displayed as "999999."

[Tips] In a case where only "HS" is displayed in the MD column of the logs, the host channel has not been found. It is necessary to check the country and postal-code settings in the user settings.

2. Detail screen

[How to enter] Press the DIG/ANA key while the Summary screen is displayed. Up to 6 detail screens (1 to 6) are displayed, one each time the DIG/ANA key is pressed. Each detail screen 1 to 6 corresponds with the EPG reception error logs from the top on the Summary screen.

[How to quit] Press the ESC key.

[Description of the Detail screens]

```
    0         1         2         3         4
    01234567890123456789012345678901234567890123456789
00  (EPG EURO)
01  EPG Data Receive Err Details - 1
02
03  Date : 03/31
04  Start Time : 13:00   END Time  : 13:30
05  Host CH    : 03      P-ON Kind : Download
06
07  Data Receive Part   Total Err  : 000000
08  Pkt Rcv Num  : 001853  Pkt Snd Num : 001853
09  Inv Line Err : 000000
10  Slice Cont : Auto EQ : OFF LV : -h
11
12  Temporary  Buffer  Information
13  Pool  Num   : 000000  Max  Store  : 000000
14  Discard Pkt  : 000000  Use  Num   : 000000
```

Line	Display item	Description	Remarks
Line 01	EPG Data Receive Err Details-X	The rightmost figure represents the number of the current detail screen. This number corresponds to the order of the EPG reception error log from the top.	
Lines 03-05, Reception conditions	Date Start Time END Time Host CH P-ON Kind	: Month/day when reception started : Time when reception started : Time when reception ended : Data-receiving channel : Methods for acquiring the EPG data (host scanning and downloading)	Only during initialization, host scanning is automatically executed to find the host broadcast.
Lines 07-10, details on errors during reception	Total Err	: Total numbers of errors during reception. The total number of Hamming Err, Trans Err and InvLine Err indicated on the Detail screen. A number 999,999 or greater is displayed as "999999."	Total Errors: If the total number of errors reaches two digits or greater, it is likely that EPG data acquisition failed. Display subscreen 1 of the first screen and check the electric field intensity from the AGC level.
	Pkt Rcv Num Pkt Snd Num	: Total number of received packages. A number 999,999 or greater is displayed as "999999." : Total number of packages that were sent to the application program among all the received packages. A number 999,999 or greater is displayed as "999999."	If the total number of received packages is 0, it is likely that the country and postal-code settings are wrong.
	InvLine Err	: Total number of errors that were generated by receiving data from invalid lines. A number 999,999 or greater is displayed as "999999."	
	Slice Cont	: Slice level control Auto-Tu Con, Manual - Syscon.	
	EQ	: Equalizer setting (ON, OFF)	
	LV	: Slice level (10~30 hex) (Only when the slice Cont is Manual.)	

Note: The data on lines 12-14 are for software development, not for service use.

7.1.8 HDMI SERVICE MODE

[Purposes]

To check the statuses of the connected HDMI devices.

[Tool to be used]

Remote control unit for servicing (GGF1381)

- HDMI device
- HDMI cable

[How to enter] • Press the ESC, then DISP key 24 times (DVR-645H-S).
[23 times (DVR-545H-S)]

Note: Do not press any key on the remote control unit supplied with the unit or for servicing while the HDMI debug screen is displayed.

[How to quit] Press the ESC key.

[Description of the mode]

1. HDMI MAIN information screen (First screen)

```
00 [HDMI]                                1/6
01  Connect:***   Reso :*********    Audio:***
02  DevType:****  Color:**********   APath:*****
03  TMDS   :***   HDCP :** : **      Fs   :***
                          SType:
[Video Check]
  Pic_Asp    :
  Active_Asp :
[Copyright Control Check]
  ACP_Type:        (Actual send:       )
  ChSts0:   ChSts1:   (C: , L: )
[Digital Tuner]
  HDMI Out: AC3 32kHz
  LL SPDIF: AC3 32kHz   DAC: 32kHz
```

(*1) [Tips]
Because all the data on connection and authenti-cation are canceled once the function of the connected HDMI device is set to a position other than HDMI, all the debugging data in Table 1 are deleted.

Table 1: Description of the items on the HDMI main information screen

Line	Item	Description	Remark
1	Connect	Connection status of the HDMI device	See Table 2.
	Reso	Output resolution	See Table 3.
	Audio	HDMI audio output status	See Table 4.
2	DevType	Type of connected device	See Table 5.
	Color	Output color	See Table 6.
3	TMDS	TMDS (video stream) signal output status	See Table 7.
	HDCP	HDCP Authentication status	See Table 8.
	Fs	Output audio Fs	See Table 9.

Table 2: Connection status of the HDMI device

Indication	Description
ON	Connected
OFF	Not connected

Table 3: Output resolution

Indication	Description
480i NTSC	720x480i NTSC
480p NTSC	720x480p NTSC
720p NTSC	1280x720p NTSC
1080i NTSC	1920x1080i NTSC
1080p NTSC	1920x1080p NTSC
576i PAL	720x576i PAL
576p PAL	720x576p PAL
720p PAL	1280x720p PAL
1080i PAL	1920x1080i PAL
1080p PAL	1920x1080p PAL
----------	TMDS Off

[Description of the Main screen] (Continued)

Table 4: HDMI audio output status

Indication	Description
OFF	Output: Off
ON	Output: On

When the unit is connected to DVI device (refer to Table 5), the Audio is not outputted.

Table 5: Type of the connected device

Indication	Description
------	Not connected
HDMI	It has been confirmed that an HDMI device supporting HDCP is connected.
DVI	It has been confirmed that a DVI device supporting HDCP is connected.

When the unit is connected to device with no HDCP support, this display is "------".

Table 6: Output color

Indication	Description
YCbCr4:2:2	Component 12 bits (YCbCr4:2:2)
YCbCr4:4:4	Component (YCbCr4:4:4)
RGB(0-255)	RGB full range (0-255)
RGB(16-235)	RGB (16-235)
----------	TMDS Off

Table 7: TMDS signal output status

Indication	Description
OFF	Output: Off
ON	Output: On

Table 8: HDCP

Left side : HDCP Authentication Status

Indication	Description
--	If an device supporting HDCP is connected, HDCP authentication is in progress.
OK	HDCP authentication succeeded.

Refer to this item only when HDMI or DVI is displayed for the item for the type of the connected device (Table 5).
If OK is not displayed although HDMI or DVI is displayed, it means that the HDCP authentication failed.

Right side : Check Revocation list

Indication	Description
--	Checking that the connected device (all downstream devices) is not registered to the Revocation list, or so.
OK	The connected device (all downstream devices) is not registered to the Revocation list.

Refer to this item only when HDMI or DVI is displayed for the item for the type of the connected device (Table 5).
When there is also no valid SRM (include Revocation list), "--" is displayed here.

Table 9: Fs

Indication	Description
32k	32kHz
44k	44.1kHz
48k	48kHz
96k	96kHz
96k/2	48kHz (original data of 96kHz is down-sampled.)
---	Audio Off

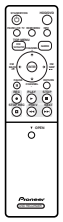
7.1.9 AGING MODE

[Purposes]

If symptoms regarding recording/ playback of discs and/or the HDD that your customer claimed are difficult to reproduce, they can be reproduced with a long-time test in Aging mode.

[Tools to be used]

Remote control unit for servicing (GGF1381)



Remote control unit supplied with the unit (VXX3129)

Commercially available, recordable DVD-R/+R and DVD-RW/+RW/ -RAM discs

[Notes]

- When aging for the DVD-RW/+RW/-RAM and HDD is executed, all recorded data on them will be erased.
- Commands from the remote control unit are accepted during Aging mode.
- If Aging mode is quit using the ESC key, indications on the FL display will return to normal display.
- Cancel timer settings before entering Aging mode.
- Set the recording rate beforehand. It cannot be changed during Aging mode.

[How to enter]

① Press the DVD key to switch to DVD.
② Load a recordable disc.
③ Select the input function of a recordable source.
④ After disc detection is performed, press the ESC then REP.B, and then PLAY keys on the remote control unit for servicing to enter Aging mode.

[How to quit]

Press the ESC key on the remote control unit for servicing to quit Aging mode and return to Normal mode.

Notes:

- If during recording: Recording is stopped.
- If during playback: Playback is paused.
- If during initialization: The unit stops after initialization is finished. ← (aging for ±RW/-RAM only)
- If the tray is being opened/closed: The unit stops after the tray is opened/closed. ←

[Description of operation] **Aging for the DVD-RW/DVD-R**

Aging for the DVD-RW/+RW/-RAM	Aging for the DVD-R/+R
During Aging mode, the following operations are repeated in the order shown below. ① The tray opens. ② The tray closes. ③ Initialization ④ Recording for 60 minutes ⑤ Playback for 45 minutes <DVD-RW> The initialization process in step 3 follows the setting specified in "Setting of the main unit--Recording--Auto initialization of a DVD-RW." <DVD+RW> The initialization process in step 3 is the same as that described in "Disc setting--Initialization--Initialization of a DVD+RW." <DVD-RAM> In the initialization process in step 3, physical formatting is performed, if required. During Aging, the number of loops is indicated on the FL display, as shown below. [AGING 0001] If an error is generated, the aging operation stops. **Note:** Indications on the FL display are retained, and this information is also retained as an OSD.	During Aging mode, the following operations are repeated in the order shown below. ① The tray opens. ② The tray closes. ③ Recording for 1 minute ④ Recording pause for 6 minutes ⑤ Recording stops. ⑥ Playback for 1 minute ⑦ Playback pause for 6 minutes ⑧ Playback stops. **Note:** A continuous test of the above operations is possible for approximately 23 hours. After ② the tray closes, disc detection is performed, <DVD-R> In step 2, if the disc is judged to have recorded up to 99 titles, the operation stops at that point. <DVD+R> If the disc is judged to have recorded up to 49 titles, the operation stops at that point. On the FL display, the number of loops is retained. On the OSD display, the error indication is retained. During Aging, the number of loops is indicated on the FL display, as shown below. [AGING 0001] If an error is generated, the aging operation stops. **Note:** Indications on the FL display are retained, and this information is also retained as an OSD. **Note:** Recording time depends on the recording rate set. For example, if the recording rate is MN32, only up to 60 titles can be registered. Check the setting for recording rate before performing aging.

[Aging for the HDD]

[How to enter]

① Press the HDD key to switch to HDD.
② Press the ESC key then the REP.B, and then the PLAY keys on the remote control unit for servicing to enter Aging mode.

[How to quit]

Press the ESC key on the remote control unit for servicing to quit Aging mode and return to Normal mode.

Notes:

- If during recording: Recording is stopped.
- If during playback: Playback is paused.
- If during erasure of all memory data from the HDD, the unit stops after all memory data have been erased.

[Description of operation]

During Aging mode, the following operations are repeated in the order shown below.
① Erasure of all the memory data from the HDD
② Recording for 60 minutes
③ Playback for 60 minutes

* *Take caution as all recorded data of the HDD is deleted.*

[Tips]

During Aging, the number of loops is indicated on the FL display, as shown below.
[AGING 0001]

If an error is generated, the aging operation stops.

Note:
Indications on the FL display are retained, and this information is also retained as an OSD.

7.1.10 HDD CHECK MODE

How to diagnose failure of the hard disc drive (HDD)

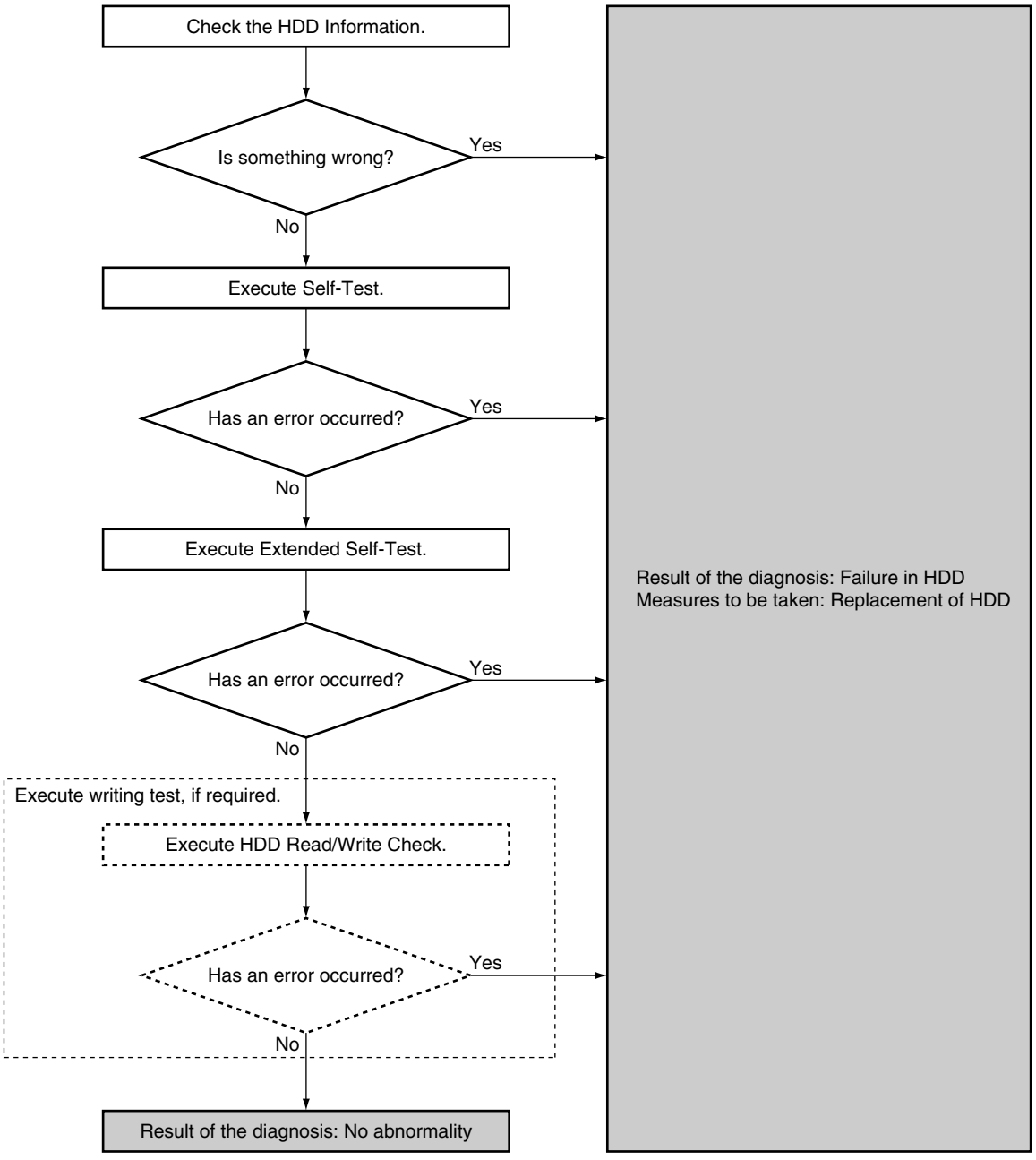
Purpose:
With use of the HDD-diagnostic program contained in the product itself, physical errors on the HDD can be diagnosed. Use this program to diagnose whether or not the HDD is in failure when one of the symptoms indicated below is recognized, or when a failure in the HDD is suspected.

Symptoms of failure in HDD:
(1) HDD Error
(2) Failure in HDD recording or playback
(3) HDD not recognized

Tool to be used:
Remote control unit for servicing (GGF1381)

1. Flow of HDD diagnosis

(1) Flowchart of HDD diagnosis



(2) Overview of the diagnosis items

HDD Information	This is a display for checking the HDD information, such as the model name of the HDD, continuous power-on time, authentication status, and results of the diagnosis on the end of service life.
SELF TEST	This is a simplified diagnosis for the HDD. A serious failure in the HDD can be detected with this test. Time required for testing: Approx. 60 sec.
EXTENDED SELF TEST	This is a reading test across all sectors of the HDD. Data recorded on the HDD will not be erased, because no writing operation is performed. Time required for testing: Approx. 3.2 hours/250 GB (DVR-645H-S) 2 hours/160 GB (DVR-545H-S)
HDD Read / Write Check	This is a writing, reading, and comparing test across all sectors of the HDD. **All data recorded on the HDD will be erased**, because all the data are to be overwritten. **Be sure to obtain your client's consent beforehand.** Time required for testing: Approx. 10 hours/250 GB (DVR-645H-S) 6.4 hours/160 GB (DVR-545H-S)

2. How to start or terminate the diagnostic program

How to start/terminate the diagnostic program

Use the remote control unit for servicing.

How to start: Press the "ESC", "CX", "0", and "1" keys simultaneously.

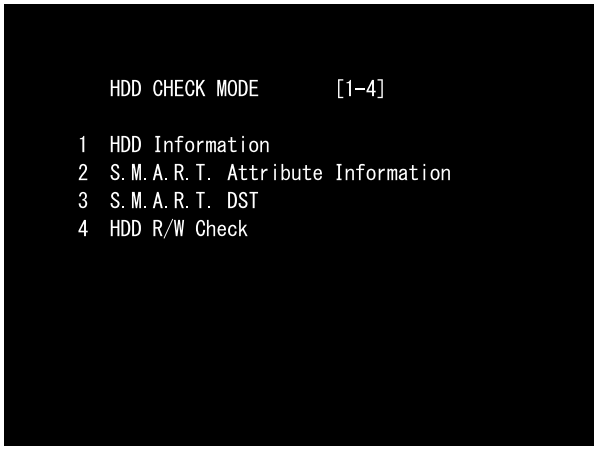
How to terminate: Press the "ESC" key.

Do NOT perform other operations on the unit while the HDD diagnosis is in progress. Although the diagnostic program is designed to function independently from the unit's functions, an operation on the unit during a diagnosis may cause a malfunction.

The status of the unit recommended during diagnosis is as follows: All stop, no timer recording (including auto-recording), and Input selection to L1-L3.

3. Diagnosis procedures

① Display the menu on the screen.
The menu indicated below is displayed when the diagnostic program is started. To enter each mode, press the corresponding key "1"-"4" on the remote control unit for servicing.



Tests to be executed
① HDD Information:
Check of the HDD information
② S.M.A.R.T. DST:
Executing a simplified test or a reading test of all data
③ HDD R/W Check:
Executing a writing/reading test of all data. All data on the HDD will be erased if this test is executed.

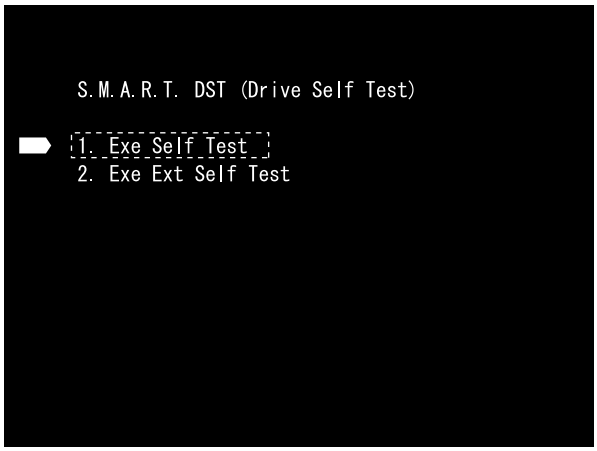
Note: "2. S.M.A.R.T. Attribute . . ." is not to be used.

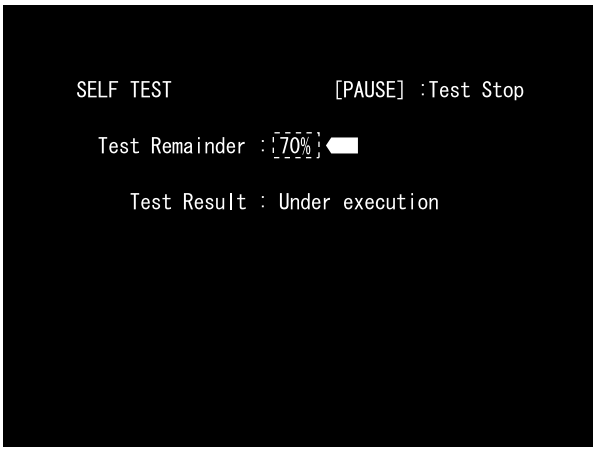
② Check the HDD information.
Press the "1" key on the remote control unit for servicing. Check the following data:
Model: Is the correct model name of the HDD displayed?
Recog. No: Is a positive value displayed?
SMART threshold: Is "not exceeded" displayed?

Detailed description
① Model:
For the correct model name, refer to the display of the unit.
② Recog. No:
Positive value: The HDD has been authenticated.
Negative value: The HDD has not been authenticated.
③ SMART threshold:
exceeded: The HDD has come to the end or near the end of its service life.
not exceeded: The HDD has not reached the end of its service life.

To return to the menu screen, press the "Clear" key.

③ Execute Self-Test.
Press the "3" key on the remote control unit for servicing while the menu screen is displayed.
When the following screen is displayed, press the "1" key to start the Self-Test.



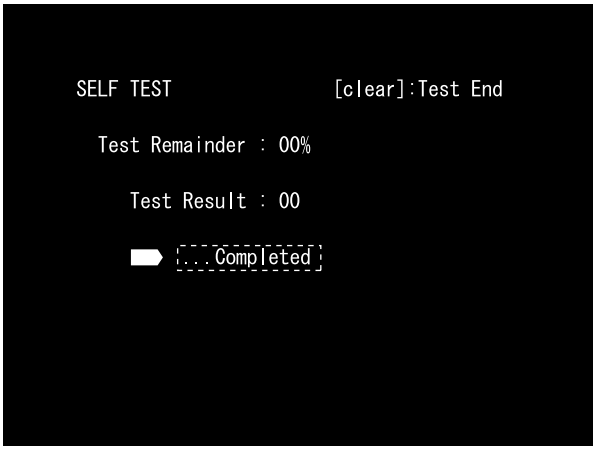


The progress of the test is displayed on the screen. The percentage remaining of the test is displayed on the screen, and the test is terminated when the percentage reaches 00%.
Check whether or not an error has occurred after the test is finished.

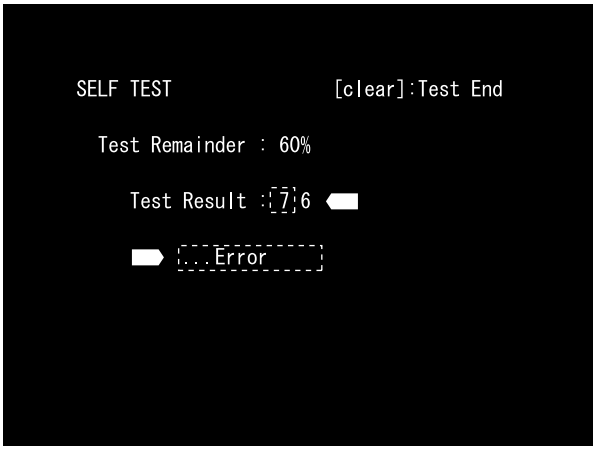
Diagnosis results
- Without an error: ". . . Completed" is displayed.
  Then, proceed to the Extended Self-Test.
- With an error: ". . . Error" is displayed. Look at the number in Test Result.
  If the place value for tens is 1 or 2, execute the Self-Test again.
  If it is from 3 to 7, the HDD must be replaced.

Note: If the result of the second test is the same, replacement of the HDD is required.

Example: No error

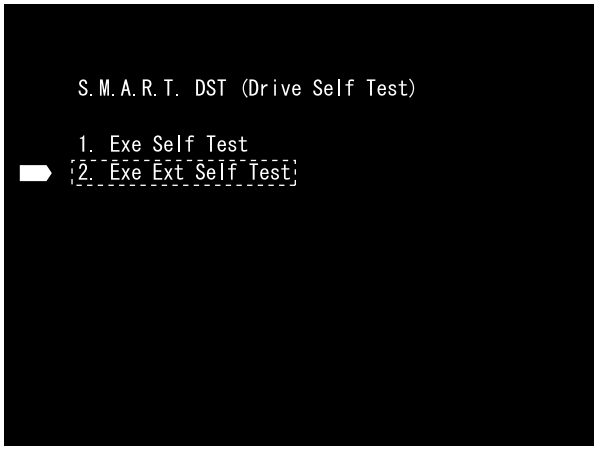


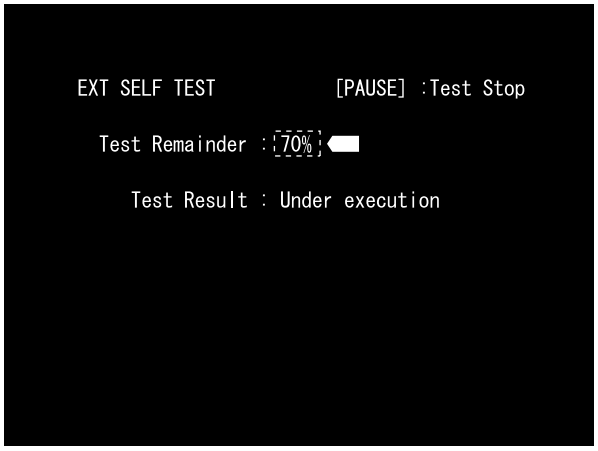
Example: With an error



To return to the menu screen, press the "Clear" key.

④ Execute the Ext (Extended) Self-Test.



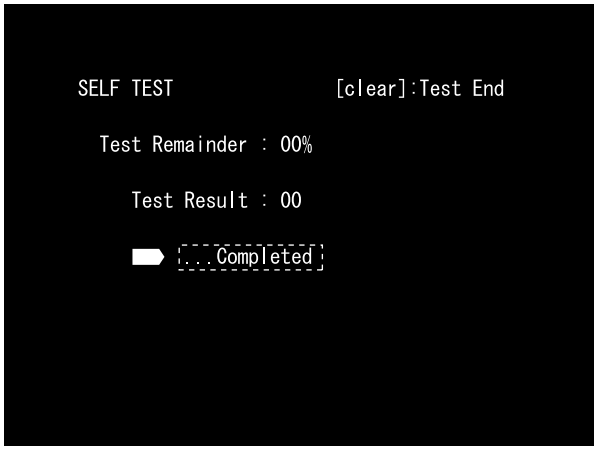


Press the "3" key while the menu screen is displayed, then the "2" key on the remote control unit for servicing. The Extended Self-Test starts. The percentage remaining of the test is displayed on the screen, and the test is terminated when the percentage reaches 00%. Check whether or not an error has occurred after the test is finished.

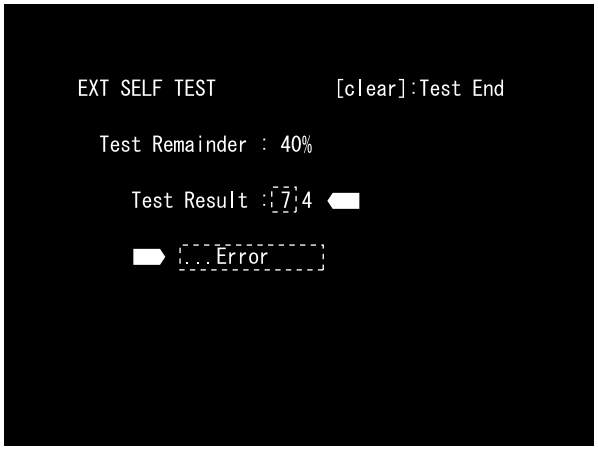
Diagnosis results
- Without an error: ". . . Completed" is displayed.
  If no error occurs up until this stage, HDD operations are normal except for writing operations.
  If the unit has a failure in HDD playback, a block other than the HDD may be in failure.
  If the unit's failure is in HDD recording, however, the next HDD Read/Write Check must be executed to test writing operations.
- With an error: ". . . Error" is displayed.
  Look at the number in Test Result.
  If the place value for tens is 1 or 2, execute the Ext Self-Test again.
  If it is from 3 to 7, the HDD must be replaced.

Note: If the result of the second test is the same, replacement of the HDD is required.

Example: No error

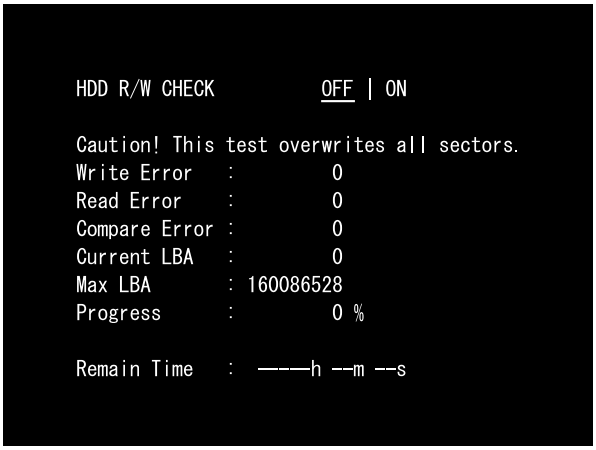


Example: With an error

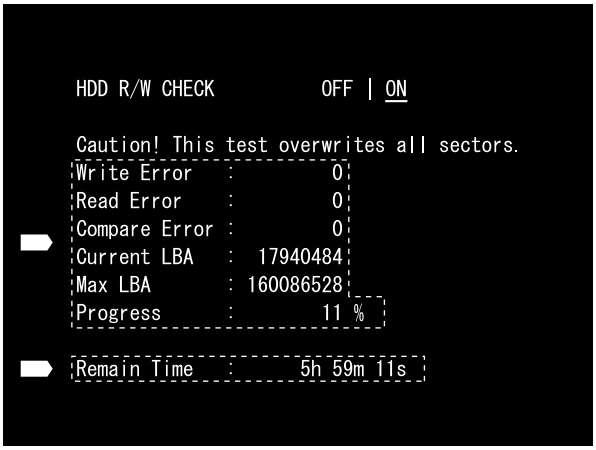


To return to the menu screen, press the "Clear" key.

⑤ Execute the HDD R/W Check.
Before executing this test, **be sure to obtain your client's consent for erasure of HDD data**.
Press the "4" key while the menu screen is displayed then the "SKIP ►►I" key to start the HDD R/W Check.
To stop executing the test (OFF) while it is in progress, press the "SKIP I◄◄" key.


HDD R/W CHECK OFF | ON
Caution! This test overwrites all sectors.
Write Error : 0
Read Error : 0
Compare Error : 0
Current LBA : 0
Max LBA : 160086528
Progress : 0 %
Remain Time : ----h --m --s

The display on the left indicates the progress of the test.
The percentage of the test progress is displayed on the screen, and the test is finished when the percentage reaches 100%.

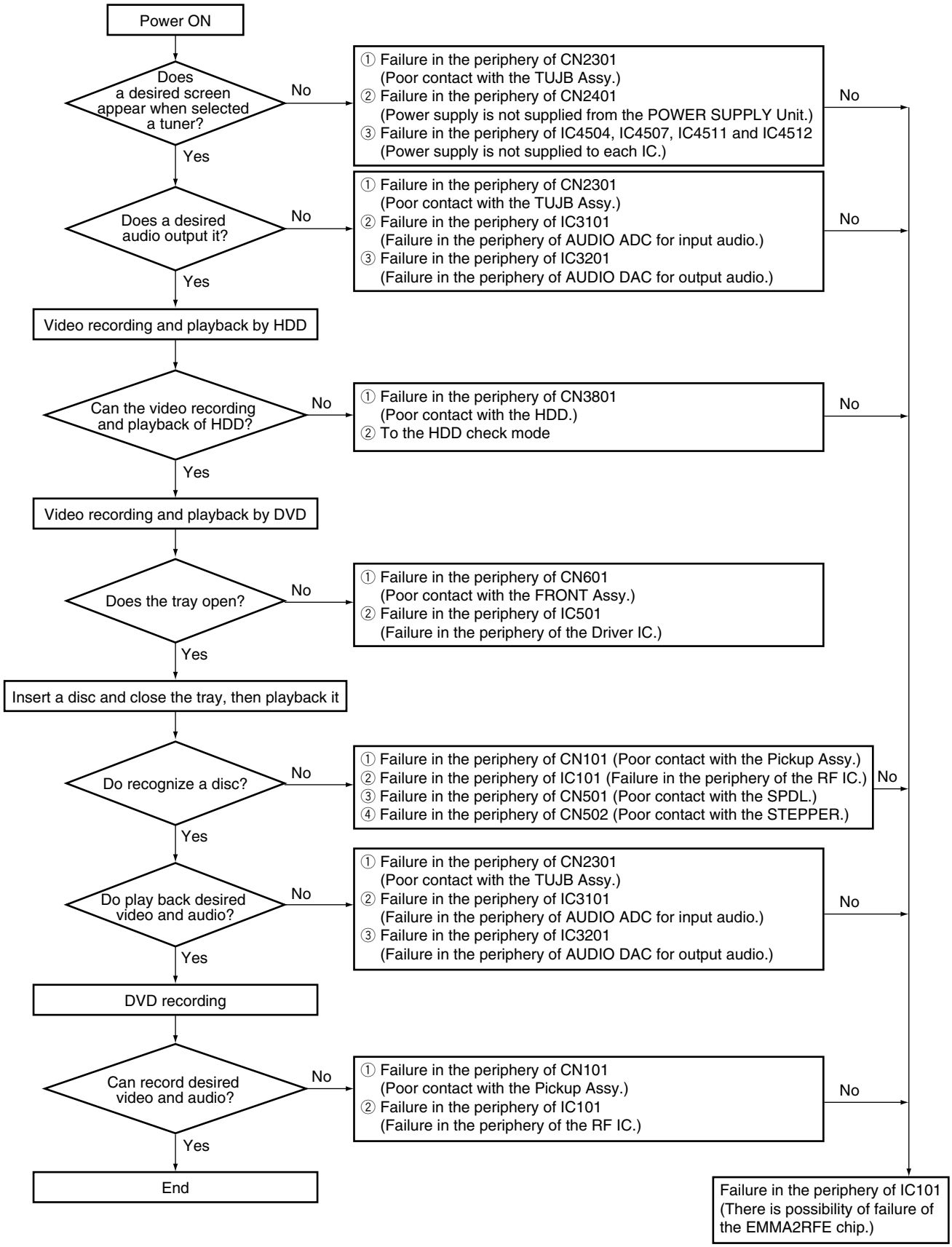

HDD R/W CHECK OFF | ON
Caution! This test overwrites all sectors.
Write Error : 0
Read Error : 0
Compare Error : 0
Current LBA : 17940484
Max LBA : 160086528
Progress : 11 %
Remain Time : 5h 59m 11s

Detailed description on each item on the screen
- Write Error: Number of write errors
- Read Error: Number of read errors
- Compare Error: Number of comparison errors
- Current LBA: The address during testing
- Max LBA: Highest address number of the HDD
- Progress: Percentage of test progress (%)
- Remain Time: Estimated time required for finishing the test across all sectors.
  Estimated time: 10 hours/250 GB (DVR-645H-S)
  6.4 hours/160 GB (DVR-545H-S)

Diagnosis results
- If no error occurs in any of the Write/Read/Compare items, the HDD is in normal condition and is not required to be replaced. A block other than the HDD is in failure.
- If any error occurs, the HDD must be replaced.

To terminate the diagnostic program, press the "ESC" key.

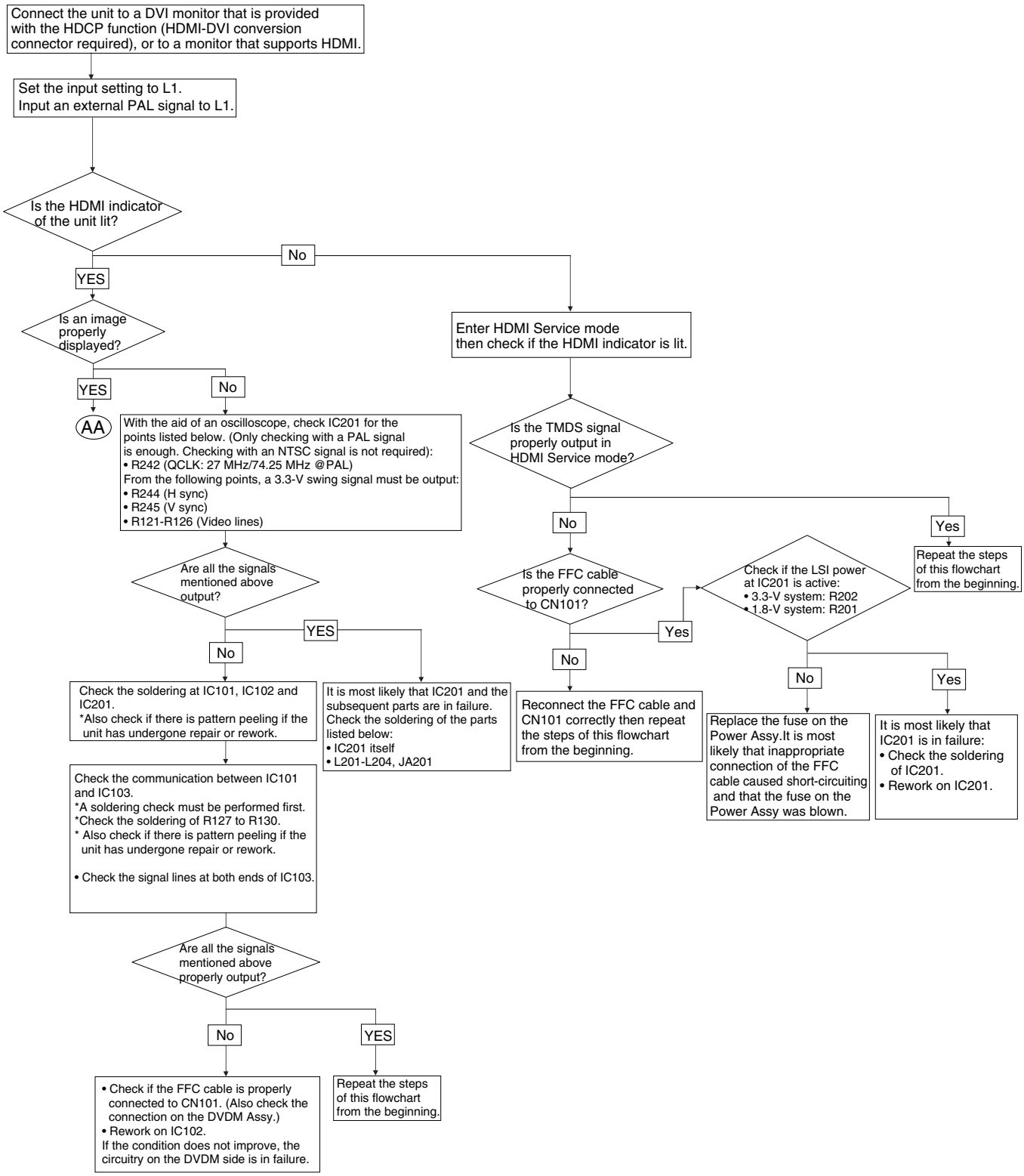
7.1.11 DIAGNOSIS OF THE MAIN ASSY

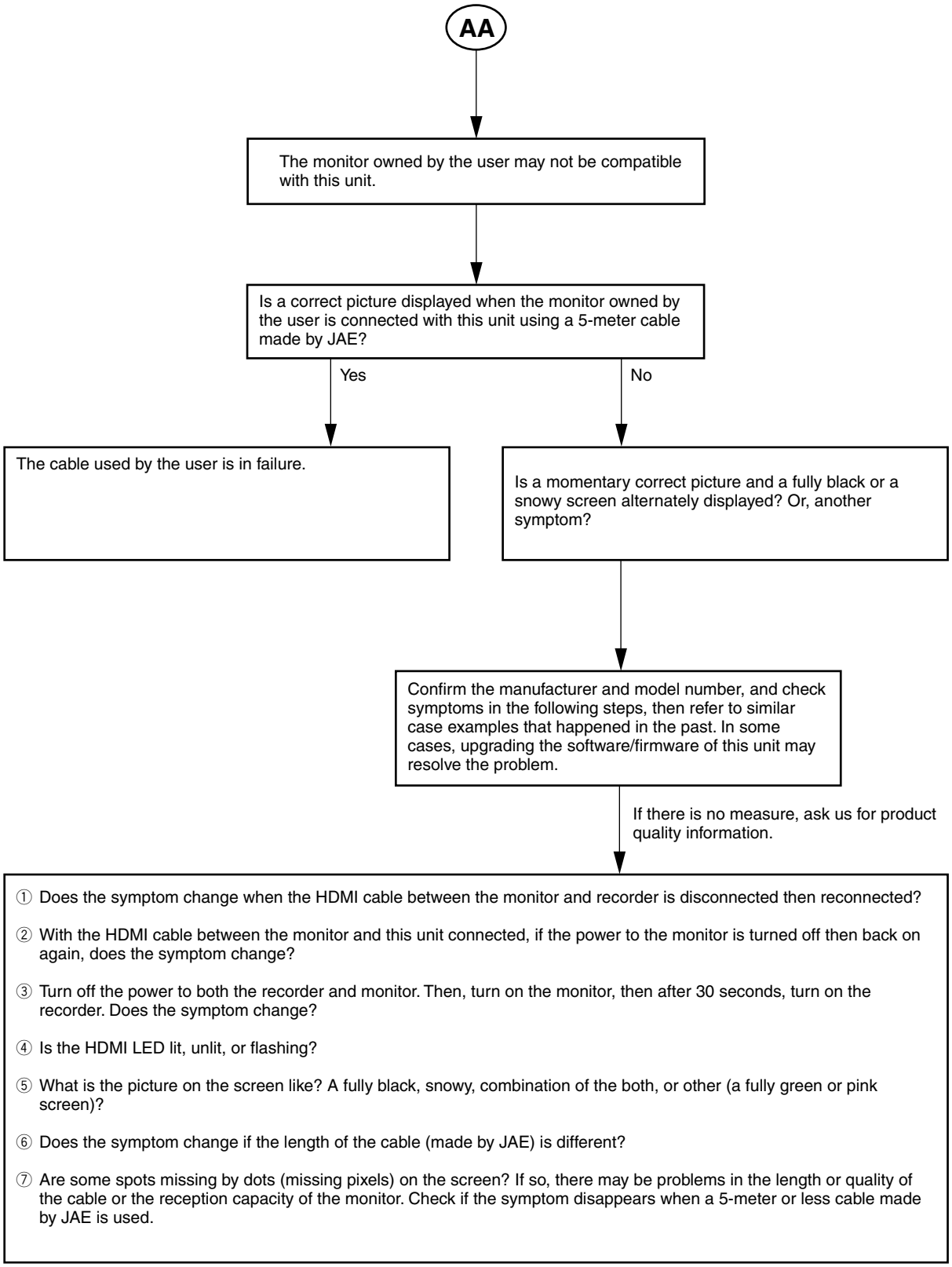

Power ON
Does a desired screen appear when selected a tuner?
No
① Failure in the periphery of CN2301 (Poor contact with the TUJB Assy.)
② Failure in the periphery of CN2401 (Power supply is not supplied from the POWER SUPPLY Unit.)
③ Failure in the periphery of IC4504, IC4507, IC4511 and IC4512 (Power supply is not supplied to each IC.)
No
Yes
Does a desired audio output it?
No
① Failure in the periphery of CN2301 (Poor contact with the TUJB Assy.)
② Failure in the periphery of IC3101 (Failure in the periphery of AUDIO ADC for input audio.)
③ Failure in the periphery of IC3201 (Failure in the periphery of AUDIO DAC for output audio.)
No
Yes
Video recording and playback by HDD
Can the video recording and playback of HDD?
No
① Failure in the periphery of CN3801 (Poor contact with the HDD.)
② To the HDD check mode
No
Yes
Video recording and playback by DVD
Does the tray open?
No
① Failure in the periphery of CN601 (Poor contact with the FRONT Assy.)
② Failure in the periphery of IC501 (Failure in the periphery of the Driver IC.)
Yes
Insert a disc and close the tray, then playback it
Do recognize a disc?
No
① Failure in the periphery of CN101 (Poor contact with the Pickup Assy.)
② Failure in the periphery of IC101 (Failure in the periphery of the RF IC.)
③ Failure in the periphery of CN501 (Poor contact with the SPDL.)
④ Failure in the periphery of CN502 (Poor contact with the STEPPER.)
No
Yes
Do play back desired video and audio?
No
① Failure in the periphery of CN2301 (Poor contact with the TUJB Assy.)
② Failure in the periphery of IC3101 (Failure in the periphery of AUDIO ADC for input audio.)
③ Failure in the periphery of IC3201 (Failure in the periphery of AUDIO DAC for output audio.)
No
Yes
DVD recording
Can record desired video and audio?
No
① Failure in the periphery of CN101 (Poor contact with the Pickup Assy.)
② Failure in the periphery of IC101 (Failure in the periphery of the RF IC.)
No
Yes
End
Failure in the periphery of IC101 (There is possibility of failure of the EMMA2RFE chip.)

7.1.12 DIAGNOSIS OF THE HDMIB ASSY

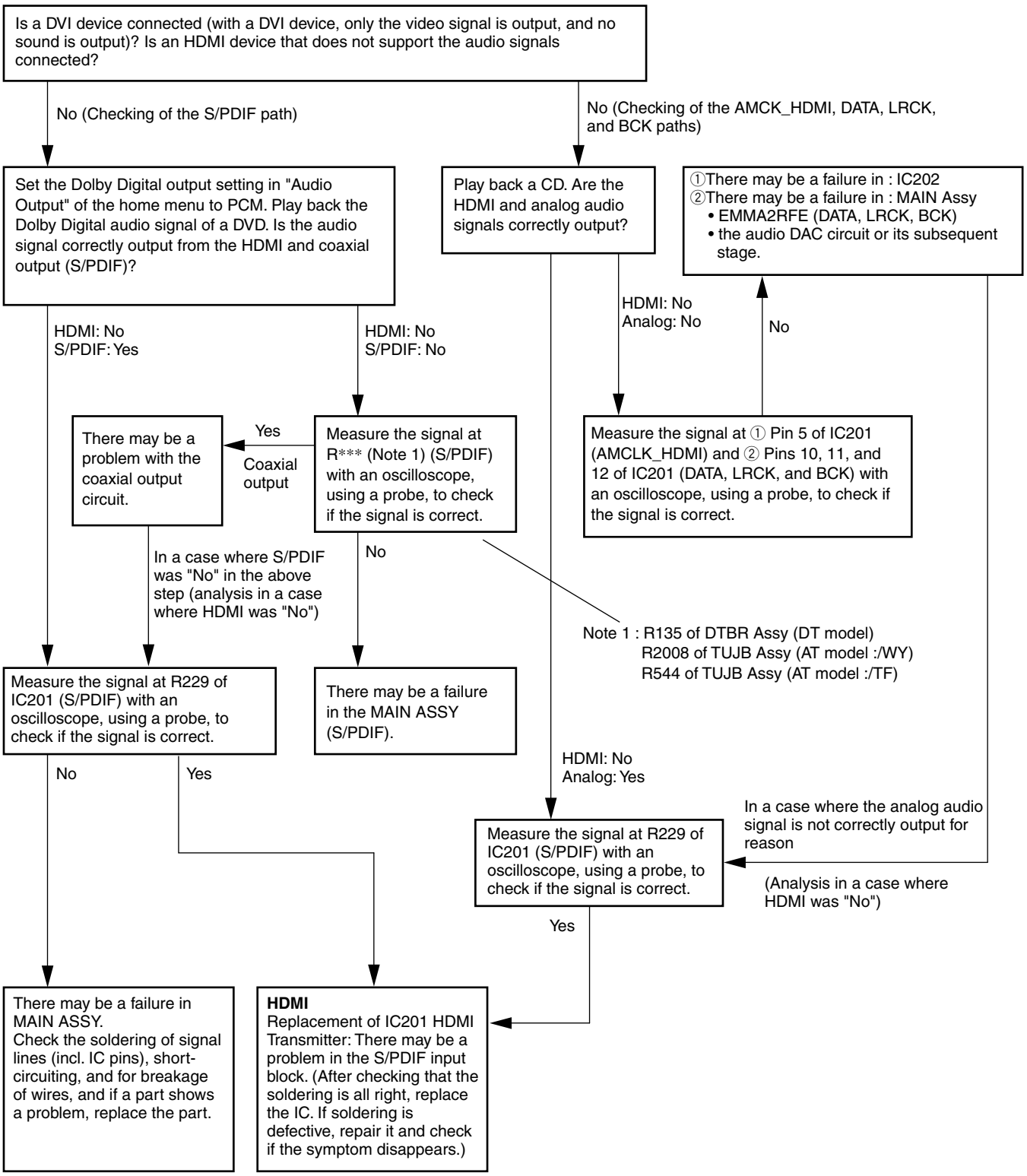
*This flowchart shows how to confirm the output from the HDMI block on the basis that an external input signal to the L1 connector is through-output from the analog output connector properly.

1. In a case when only the HDMI video is not outputted


Connect the unit to a DVI monitor that is provided with the HDCP function (HDMI-DVI conversion connector required), or to a monitor that supports HDMI.
Set the input setting to L1.
Input an external PAL signal to L1.
Is the HDMI indicator of the unit lit?
No
YES
Is an image properly displayed?
YES
No
AA
With the aid of an oscilloscope, check IC201 for the points listed below. (Only checking with a PAL signal is enough. Checking with an NTSC signal is not required):
• R242 (QCLK: 27 MHz/74.25 MHz @PAL)
From the following points, a 3.3-V swing signal must be output:
• R244 (H sync)
• R245 (V sync)
• R121-R126 (Video lines)
Are all the signals mentioned above output?
YES
No
Check the soldering at IC101, IC102 and IC201.
*Also check if there is pattern peeling if the unit has undergone repair or rework.
It is most likely that IC201 and the subsequent parts are in failure. Check the soldering of the parts listed below:
• IC201 itself
• L201-L204, JA201
Check the communication between IC101 and IC103.
*A soldering check must be performed first.
*Check the soldering of R127 to R130.
* Also check if there is pattern peeling if the unit has undergone repair or rework.
• Check the signal lines at both ends of IC103.
Are all the signals mentioned above properly output?
No
YES
• Check if the FFC cable is properly connected to CN101. (Also check the connection on the DVDM Assy.)
• Rework on IC102.
If the condition does not improve, the circuitry on the DVDM side is in failure.
Repeat the steps of this flowchart from the beginning.
Enter HDMI Service mode then check if the HDMI indicator is lit.
Is the TMDS signal properly output in HDMI Service mode?
No
Yes
Repeat the steps of this flowchart from the beginning.
Is the FFC cable properly connected to CN101?
Yes
No
Reconnect the FFC cable and CN101 correctly then repeat the steps of this flowchart from the beginning.
Check if the LSI power at IC201 is active:
• 3.3-V system: R202
• 1.8-V system: R201
No
Yes
Replace the fuse on the Power Assy.It is most likely that inappropriate connection of the FFC cable caused short-circuiting and that the fuse on the Power Assy was blown.
It is most likely that IC201 is in failure:
• Check the soldering of IC201.
• Rework on IC201.


AA
The monitor owned by the user may not be compatible with this unit.
Is a correct picture displayed when the monitor owned by the user is connected with this unit using a 5-meter cable made by JAE?
Yes
No
The cable used by the user is in failure.
Is a momentary correct picture and a fully black or a snowy screen alternately displayed? Or, another symptom?
Confirm the manufacturer and model number, and check symptoms in the following steps, then refer to similar case examples that happened in the past. In some cases, upgrading the software/firmware of this unit may resolve the problem.
If there is no measure, ask us for product quality information.
① Does the symptom change when the HDMI cable between the monitor and recorder is disconnected then reconnected?
② With the HDMI cable between the monitor and this unit connected, if the power to the monitor is turned off then back on again, does the symptom change?
③ Turn off the power to both the recorder and monitor. Then, turn on the monitor, then after 30 seconds, turn on the recorder. Does the symptom change?
④ Is the HDMI LED lit, unlit, or flashing?
⑤ What is the picture on the screen like? A fully black, snowy, combination of the both, or other (a fully green or pink screen)?
⑥ Does the symptom change if the length of the cable (made by JAE) is different?
⑦ Are some spots missing by dots (missing pixels) on the screen? If so, there may be problems in the length or quality of the cable or the reception capacity of the monitor. Check if the symptom disappears when a 5-meter or less cable made by JAE is used.

2. In a case when only the HDMI audio is not outputted


Is a DVI device connected (with a DVI device, only the video signal is output, and no sound is output)? Is an HDMI device that does not support the audio signals connected?
No (Checking of the S/PDIF path)
No (Checking of the AMCK_HDMI, DATA, LRCK, and BCK paths)
Set the Dolby Digital output setting in "Audio Output" of the home menu to PCM. Play back the Dolby Digital audio signal of a DVD. Is the audio signal correctly output from the HDMI and coaxial output (S/PDIF)?
Play back a CD. Are the HDMI and analog audio signals correctly output?
①There may be a failure in : IC202
②There may be a failure in : MAIN Assy
• EMMA2RFE (DATA, LRCK, BCK)
• the audio DAC circuit or its subsequent stage.
HDMI: No
S/PDIF: Yes
HDMI: No
S/PDIF: No
HDMI: No
Analog: No
No
There may be a problem with the coaxial output circuit.
Yes
Coaxial output
Measure the signal at R*** (Note 1) (S/PDIF) with an oscilloscope, using a probe, to check if the signal is correct.
Measure the signal at ① Pin 5 of IC201 (AMCLK_HDMI) and ② Pins 10, 11, and 12 of IC201 (DATA, LRCK, and BCK) with an oscilloscope, using a probe, to check if the signal is correct.
In a case where S/PDIF was "No" in the above step (analysis in a case where HDMI was "No")
No
Note 1 : R135 of DTBR Assy (DT model)
R2008 of TUJB Assy (AT model :/WY)
R544 of TUJB Assy (AT model :/TF)
Measure the signal at R229 of IC201 (S/PDIF) with an oscilloscope, using a probe, to check if the signal is correct.
There may be a failure in the MAIN ASSY (S/PDIF).
HDMI: No
Analog: Yes
In a case where the analog audio signal is not correctly output for reason
Measure the signal at R229 of IC201 (S/PDIF) with an oscilloscope, using a probe, to check if the signal is correct.
(Analysis in a case where HDMI was "No")
No
Yes
Yes
There may be a failure in MAIN ASSY.
Check the soldering of signal lines (incl. IC pins), short-circuiting, and for breakage of wires, and if a part shows a problem, replace the part.
HDMI
Replacement of IC201 HDMI Transmitter: There may be a problem in the S/PDIF input block. (After checking that the soldering is all right, replace the IC. If soldering is defective, repair it and check if the symptom disappears.)

7.1.13 NOTE ON REPLACEMENT OF THE SDRAM

Note when replacing the SDRAM

When replacement of the SDRAM (IC1201 or IC1221) on the MAIN Assy is required, identify the manufacturer of the SDRAM.
If the SDRAM that needs replacement was manufactured by HYNIX, both IC1201 and IC1221 must be replaced at the same time.
SDRAMs for service are manufactured by SAMSUNG.

• How to identify the manufacturer

Confirm the name of the manufacturer stamped on the surface of the part.

By HYNIX (replacement of both SDRAMs required)

By SAMSUNG (replacement of only the defective SDRAM possible)

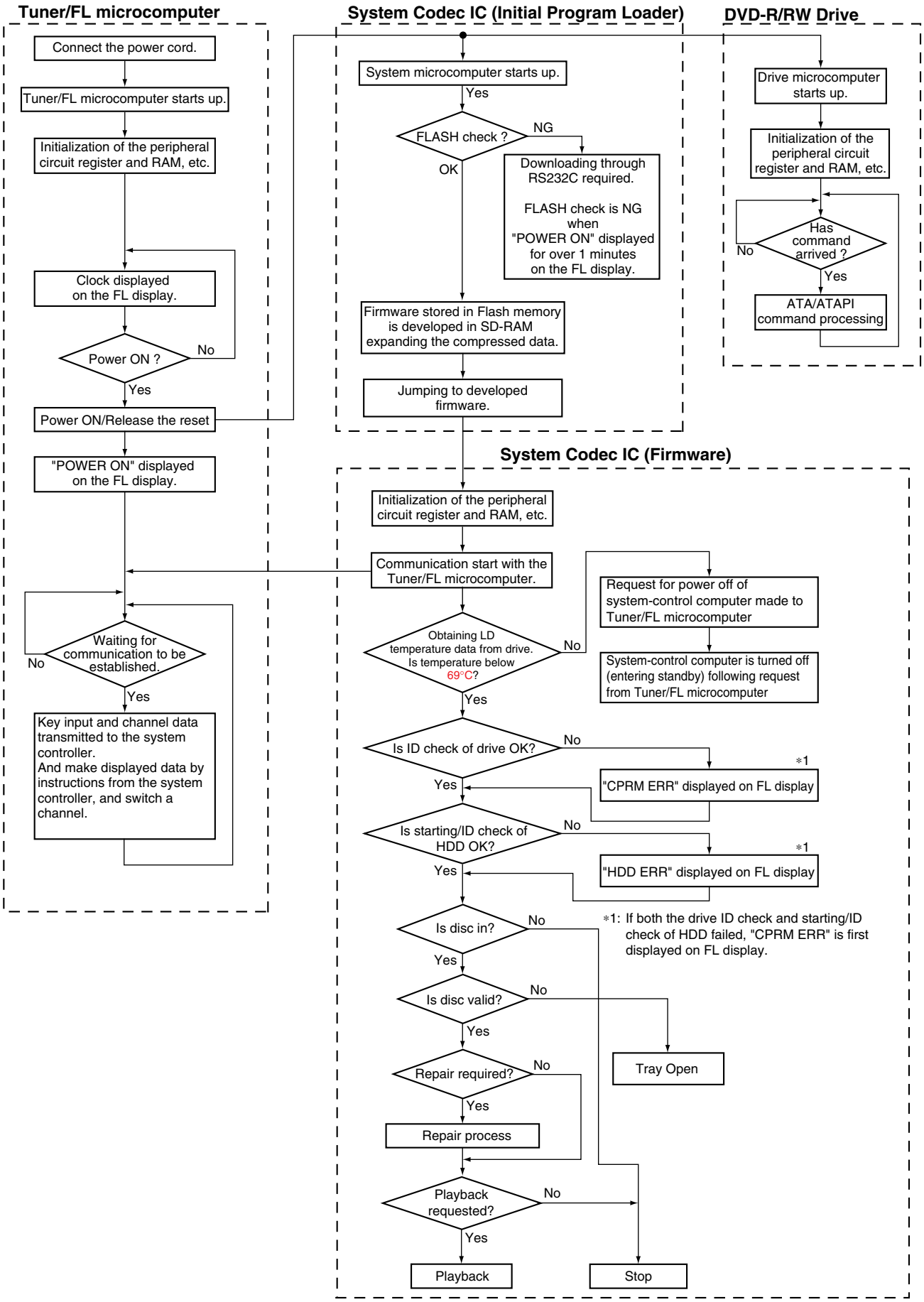
• Measures to be taken

① If the SDRAM that needs replacement was manufactured by HYNIX:
Replace both IC1201 and IC1221 at the same time.
② If the SDRAM that needs replacement was manufactured by SAMSUNG:
Replacement of only the defective SDRAM (IC1201 or IC1221) is possible.

• Possible malfunctions

If SDRAMs made by different manufacturers are mounted on the MAIN Assy, the following malfunctions may occur:
① The power does not come on.
② High-speed dubbing disabled
③ Other malfunctions related to the SDRAM

7.1.14 SETUP SEQUENCE


Tuner/FL microcomputer
Connect the power cord.
Tuner/FL microcomputer starts up.
Initialization of the peripheral circuit register and RAM, etc.
Clock displayed on the FL display.
Power ON ?
No
Yes
Power ON/Release the reset
"POWER ON" displayed on the FL display.
Waiting for communication to be established.
No
Yes
Key input and channel data transmitted to the system controller.
And make displayed data by instructions from the system controller, and switch a channel.
System Codec IC (Initial Program Loader)
System microcomputer starts up.
Yes
FLASH check ?
NG
OK
Downloading through RS232C required.
FLASH check is NG when "POWER ON" displayed for over 1 minutes on the FL display.
Firmware stored in Flash memory is developed in SD-RAM expanding the compressed data.
Jumping to developed firmware.
DVD-R/RW Drive
Drive microcomputer starts up.
Initialization of the peripheral circuit register and RAM, etc.
Has command arrived ?
No
Yes
ATA/ATAPI command processing
System Codec IC (Firmware)
Initialization of the peripheral circuit register and RAM, etc.
Communication start with the Tuner/FL microcomputer.
Obtaining LD temperature data from drive. Is temperature below 69°C?
No
Yes
Request for power off of system-control computer made to Tuner/FL microcomputer
System-control computer is turned off (entering standby) following request from Tuner/FL microcomputer
Is ID check of drive OK?
No
Yes
*1
"CPRM ERR" displayed on FL display
Is starting/ID check of HDD OK?
No
Yes
*1
"HDD ERR" displayed on FL display
Is disc in?
No
Yes
Is disc valid?
No
Yes
Tray Open
Repair required?
No
Yes
Repair process
Playback requested?
No
Yes
Playback
Stop
*1: If both the drive ID check and starting/ID check of HDD failed, "CPRM ERR" is first displayed on FL display.

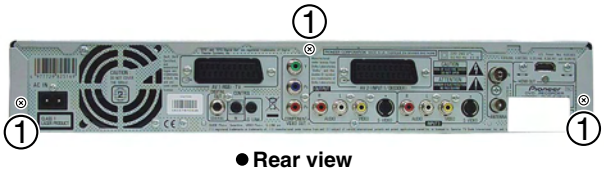
7.1.15 DISASSEMBLY

Note 1: Do NOT look directly into the pickup lens. The laser beam may cause eye injury.
Note 2: Even if the unit shown in the photos and illustrations in this manual may differ from your product, the procedures described here are common.
Note 3: For performing the diagnosis shown below, the following jigs for service is required:
- Emergency disc ejection rod (GGF1529)
- Flexible cable for service (GGD1478), (VKP2291)

Diagnosis

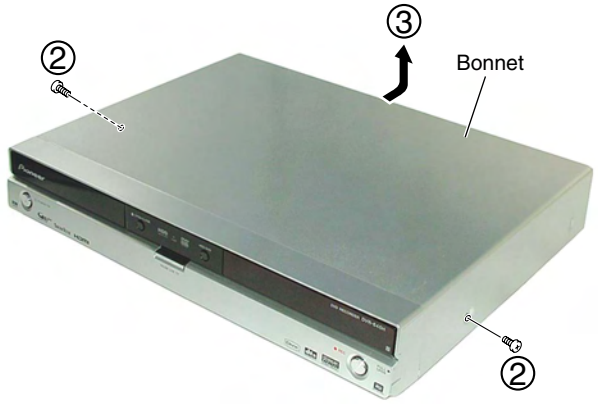
1 Bonnet

① Remove the three screws.



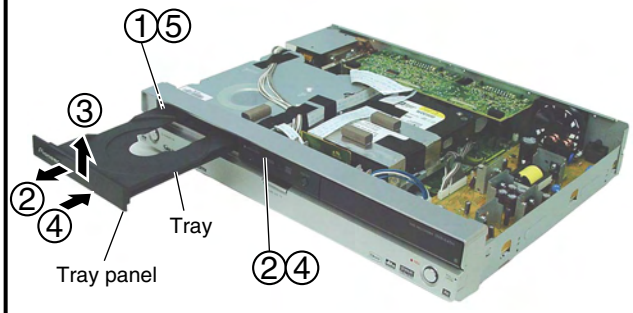
● **Rear view**

② Remove the two screws.
③ Remove the bonnet.



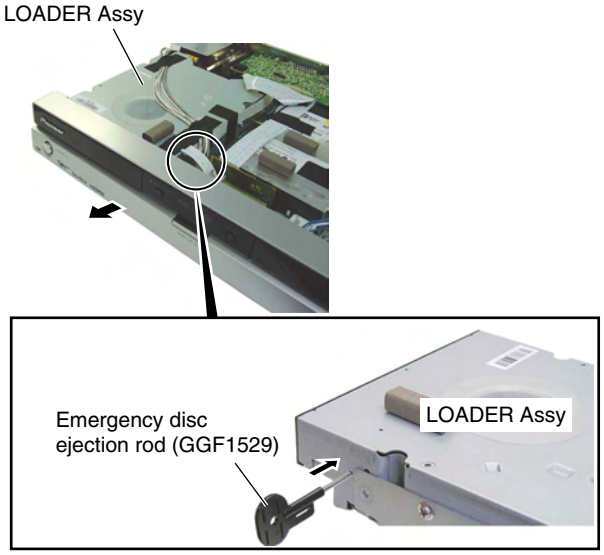
2 Tray Panel

① Press the ⏻ STANDBY/ON button to turn on the power.
② Press the ⏏ OPEN/CLOSE button to open the tray.
③ Remove the tray panel.
④ Press the ⏏ OPEN/CLOSE button to close the tray.
⑤ Press the ⏻ STANDBY/ON button to turn off the power.



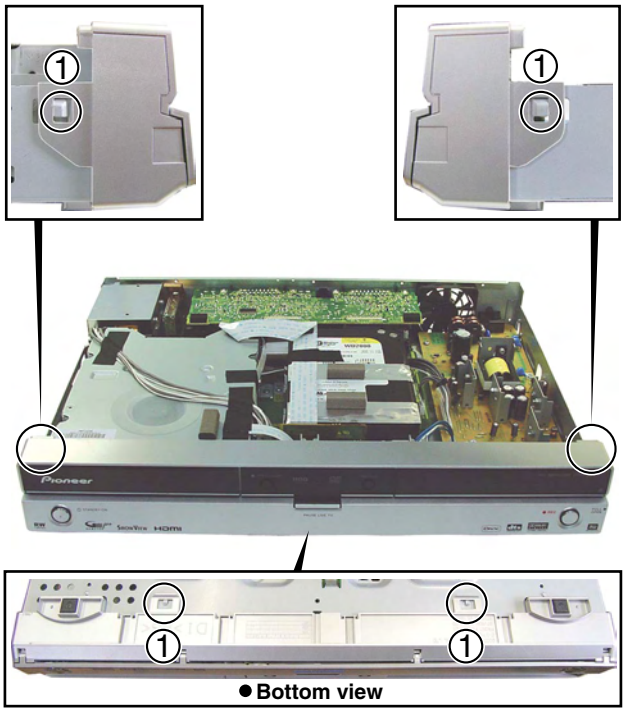
● **How to open the tray when the power cannot be turned on**

When the tray cannot be opened because the power cannot be turned on, it can be opened using the emergency disc ejection rod (GGF1529). (A long, thin rod about 1 mm in diameter can be used in place of the rod.)



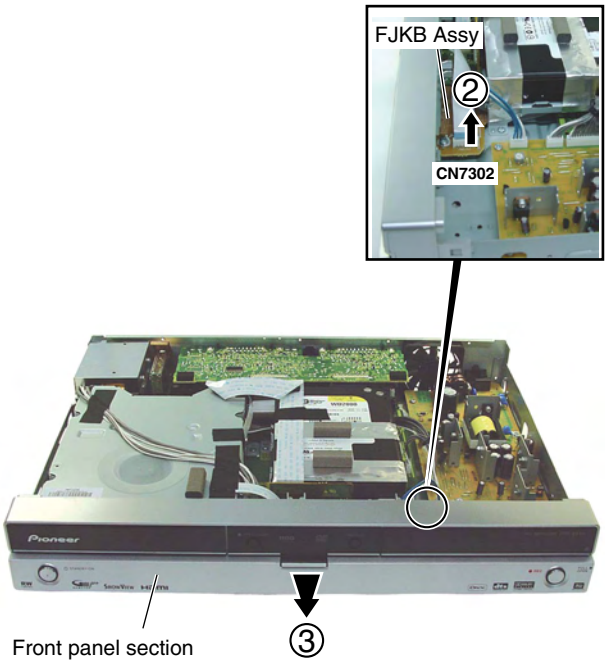
3 Front Panel Section

① Unhook the four hooks.



② Disconnect the one flexible cable.

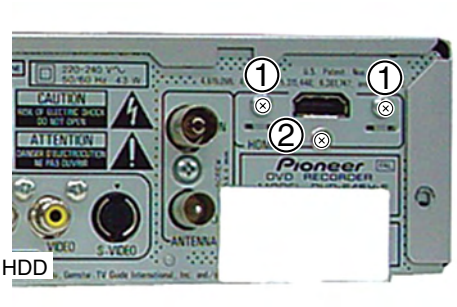
③ Remove the front panel section.



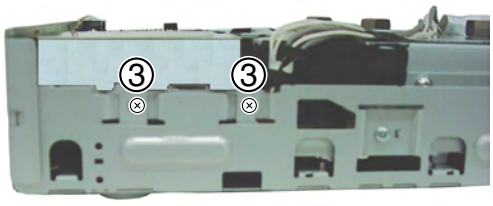
4 HDMIB Assy

① Remove the two screws.

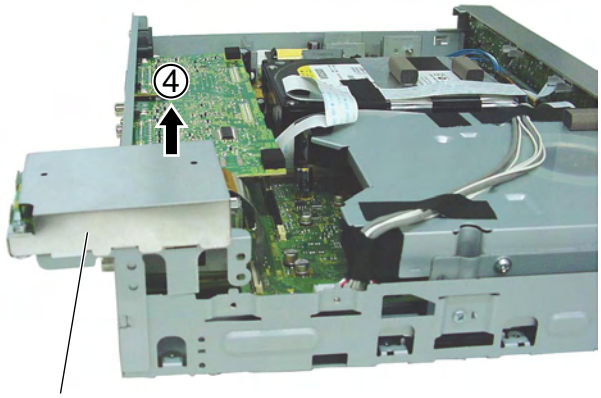
② Remove the one screw.



③ Remove the two screws.



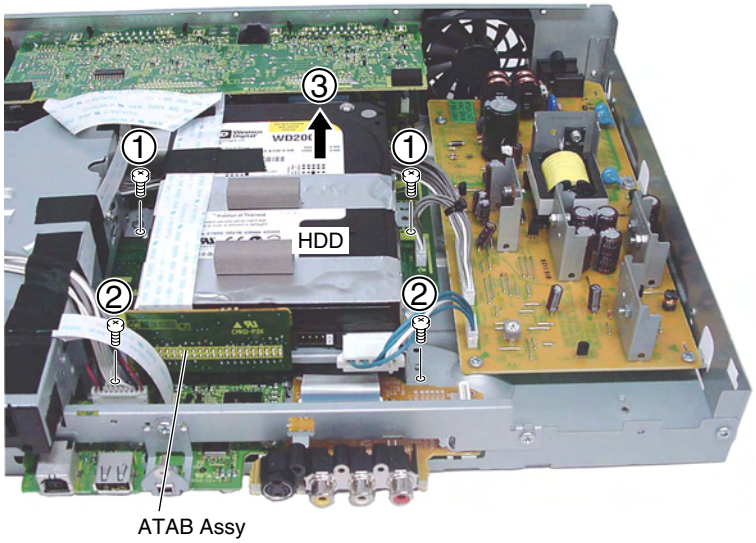
④ Remove the HDMI Assy.
(Disconnect cables, as required.)



5 HDD and LOADER Assy

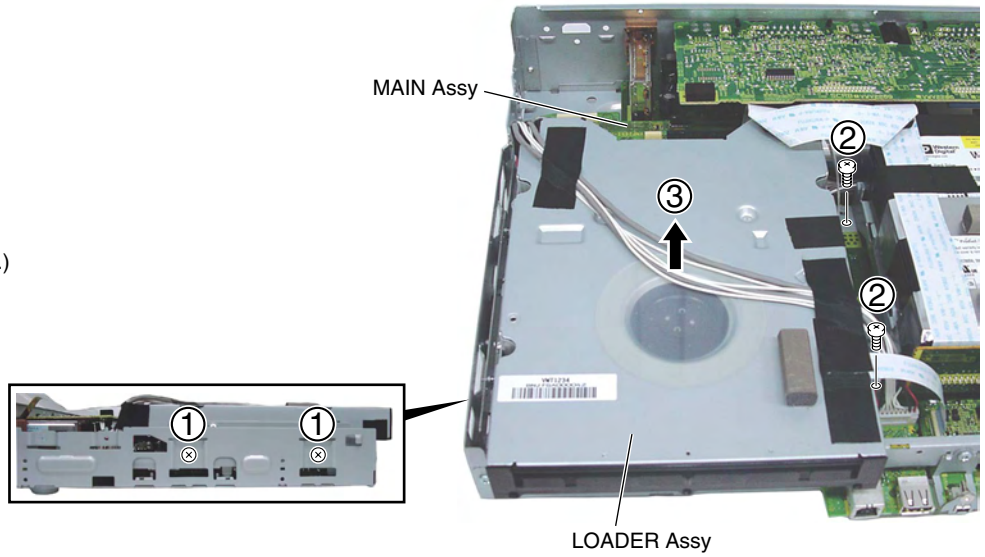
• HDD

① Remove the two screws.
② Remove the two screws.
③ Remove the HDD with the ATAB Assy and the HDD stay.
(Disconnect cables, as required.)



• LOADER Assy

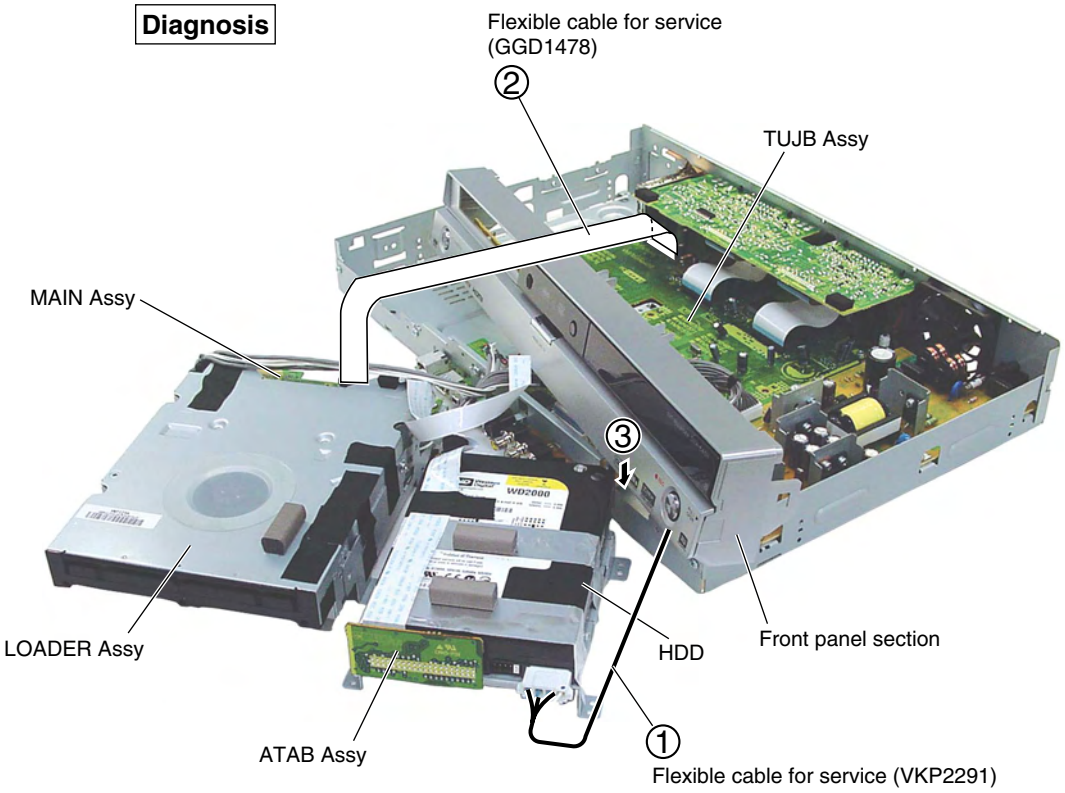
① Remove the two screws.
② Remove the two screws.
③ Remove the LOADER Assy.
(Disconnect cables, as required.)



6 Diagnosis

① Connect the flexible cable for service.
② Connect the flexible cable for service.
③ Reassembling the front panel section.
④ Arrange the unit as shown in the photo below.

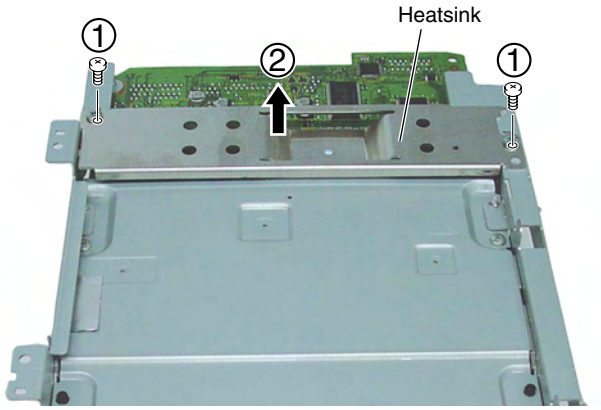
Diagnosis



Access to the MAIN Assy, Cleanning the Pickup Lens

• Heatsink

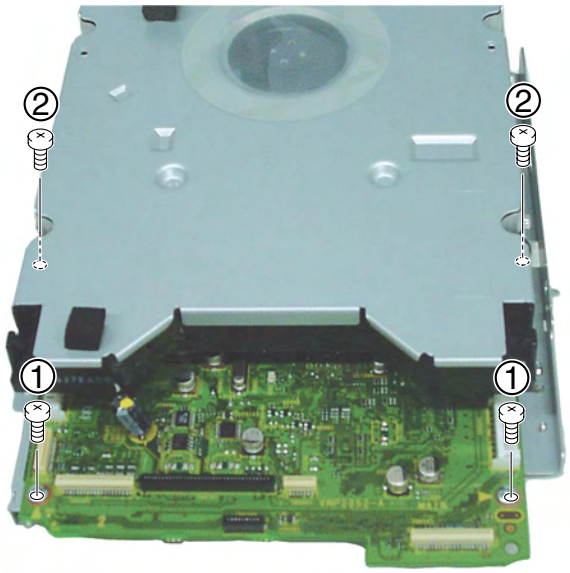
① Remove the two screws.
② Remove the heatsink.



● Bottom view

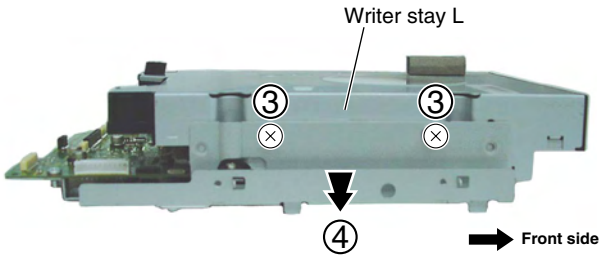
• Writer Stay L and R

① Remove the two screws.
② Remove the two screws.

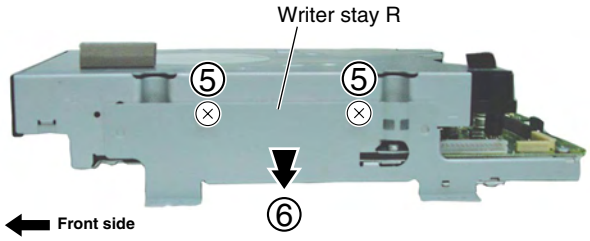


● Rear view

③ Remove the two screws.
④ Remove the writer stay L.



⑤ Remove the two screws.
⑥ Remove the writer stay R.

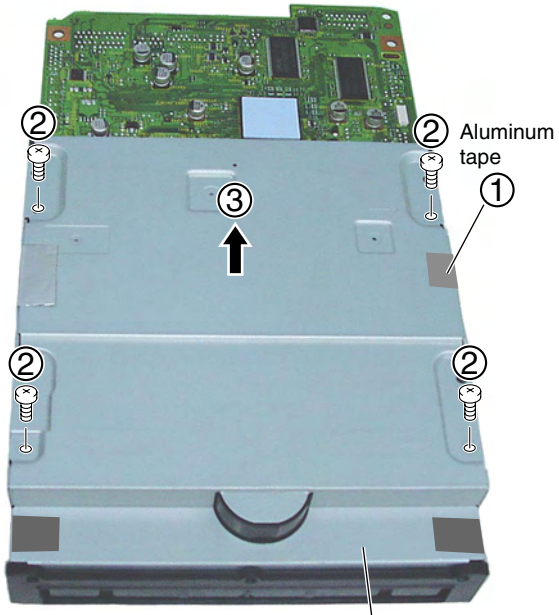


• Low Case U11 and UP Case S

① Remove the aluminum tape 25 × 25.

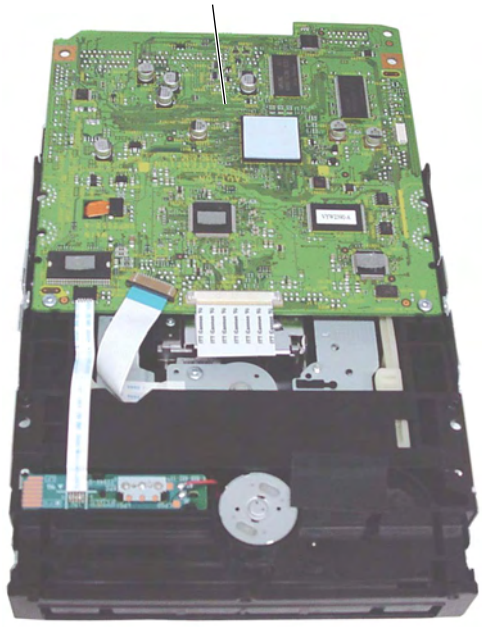
② Remove the four screws.

③ Remove the low case U11.



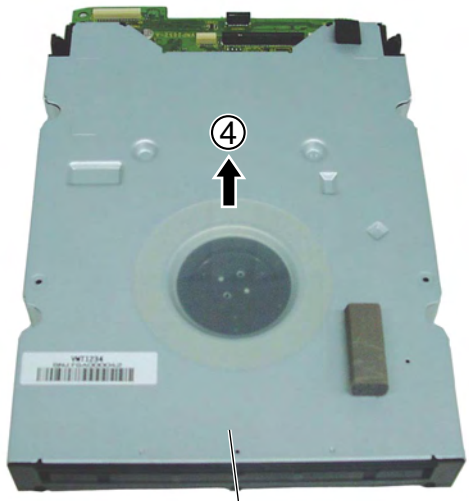
● Bottom view

Low case U11



● Bottom view

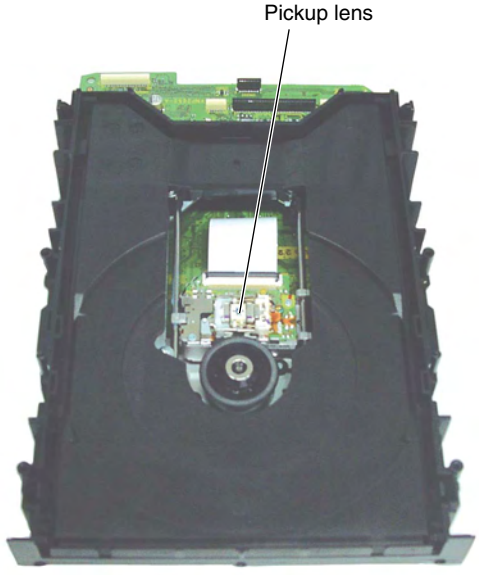
④ Remove the UP case S.



UP case S

Before shipment, be sure to clean the pickup lens, using the following cleaning materials:

Cleaning liquid : GEM1004
Cleaning paper : GED-008



7.2 IC

• The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

● **List of IC**

PMC014A8, UPD61272F1-107KA3A, TDOTG242-0F0C8, UPD72893BF1-FN3, BH7236AF, BD6517F, CD0041AF

■ PMC014A8 (TUJB ASSY : IC101)

• TUNER Microcomputer

● **Pin Function**

No.	Mark	Pin Name	I/O	Pin Function
1	PA3/SO8	FLDATA	O	Communication line with FL driver From tuner controller to FL driver
2	PA4/SI8/SB8	FLSTB	O	Communication strobe signal with FL driver
3	PA5/SCK8	FLCLK	O	Communication clock with FL driver
4	P70/INT0/T0LCP	WDT	I	WDT for microcomputer runaway detection RC is external connection. H: Forced reset
5	P71/INT1/T0HCP	ACDET	I	Existence detection of AC power Level interrupt
6	P72/INT2/T0IN/T0LCP	HS_MTOT	I	System controller communication handshake From system controller to Tuner controller
7	P73/INT3/T0IN/T0HCP	IR	I	Pulse input of the remote control unit
8	RES#	XTRESET	I	Reset input
9	XT1	XT1	I	Sub clock connection 32.768kHz
10	XT2	XT2	O	Sub clock connection
11	VSS1	GND	–	Ground
12	CF1	CF1	I	Main clock connection 15MHz
13	CF2	CF2	O	Main clock connection
14	VDD1	VDD1	–	Power supply
15	P80/AN0	MODEL1	AI	Input 1 for destination judgment
16	P81/AN1	MODEL2	AI	Input 2 for destination judgment
17	P82/AN2	KEY1	AI	Main unit key input 1
18	P83/AN3	KEY2	AI	Main unit key input 2
19	P84/AN4	KEY3	AI	Main unit key input 3
20	P85/AN5	AGC	AI	AGC voltage input from the tuner
21	P86/AN6	BATTERY	AI	Input for battery voltage check It is not used but pull-up is necessary.
22	P87/AN7	FUNC	AI	SCART Function signal input
23	P10/SO0	SDET3	I	Plug detection of S terminal 3
24	P11/SI0/SB0	SDET2	I	Plug detection of S terminal 2
25	P12/SCK0	SDET1	I	Plug detection of S terminal 1
26	P13/SO1	AVLOUT	O	AV.Link output signal Negative logic Reverse on the SCART terminal
27	P14/SI1/SB1	SDA	O/D	IIC communication (data)
28	P15/SCK1	SCL	O/D	IIC communication (clock)
29	P16/T1PWML	XSYSRST	O	IC reset signal of whole system
30	P17/T1PWMH/BUZ	TUDET	I	The old and the new distinction of the tuner pack L: New tuner, H: Old tuner
31	PE0/AN12	MUTEV	O	Not used
32	PE1/AN13	NC	I	
33	PE2/AN14	AMUTE2	O	Audio mute signal of output stage Negative logic H: Release, L: Mute
34	PE3/AN15	SELV1	O	Input switch of Y/C output of HA118326 and Y/C from S terminal 3
35	PE4	SELV2	O	Input switch of slicer input (81: CVBSIN)
36	PE5	SELV3	O	Not used
37	PE6	YVSEL	O	Not used
38	PE7	SWSTBY	O	Not used
39	VSS4	GND	–	Ground
40	VDD4	VDD4	–	Power supply

No.	Mark	Pin Name	I/O	Pin Function
41	PF0	FUNC_ON	O	Function output signal
42	PF1	SQU	O	Squeeze output superimposed signal
43	PF2	CONDET	I	Electric discharge detection of capacitor for power supply backup
44	PF3	S1	O	Not used
45	PF4/IRP	IROUT	O	Pulse output for IR blaster
46	PF5	P_SAVE2	O	Power save mode switch of HA118326
47	PF6	PSMUTE	O	Audio mute control of SCART
48	PF7	XAVLTH	O	Through switch of AV.Link communication line
49	SI2P0/SO2	SO2	O	SIO2 transmission Not used.
50	SI2P1/SI2/SB2	SI2	O	SIO2 reception Not used.
51	SI2P2/SCK2	SCK2	O	SIO2 communication clock Not used.
52	SI2P3/SCK20	RFTHRU	O	RF through switch of the tuner Control with the main unit setting during standby.
53	PWM1	LED_PON	O	Not used
54	PWM0	FANCTRL	O	Radiation of heat fan rotating speed control H: Top speed, L: Stop Intermediate speed realizes by PWM
55	VDD2	VDD2	–	Power supply
56	VSS2	GND	–	Ground
57	P00	P_CONT2	O	Power supply control of the main board For controlling 2.5V and 3.3V
58	P01	MUTECTL	O	Mute invalidity control Port to suppress last stage mute
59	P02	EPGEXT	O	Equalizer switch of slicer input video
60	P03	TUON	O	Power supply control of the tuner section There is a case to turn on the power during standby independently.
61	P04	NC	O	
62	P05/CKO	P_CONT	O	Power supply control of the whole system
63	P06/T6O	FLPON	O	Power supply control of the FL tube
64	P07/T7O	XP_SAVE	O	Power supply control of video system
65	P20/INT4/T1IN/T0LCP/T0HCP/INT6/T0LCP1/SSGI0	STATCHG	I	Multiplex status change detection of MSP D_CTR_I/O_1 of MSP
66	P21/INT4/T1IN/T0LCP/T0HCP	NC	I	
67	P22/INT4/T1IN/T0LCP/T0HCP/HCTR	CSYNCIN	I	C-Sync for Auto Start Recording (Not used)
68	P23/INT4/T1IN/T0LCP/T0HCP	XCHECKER	I	Unit checker mounting distinction
69	P24/INT5/T1IN/T0LCP/T0HCP/INT7/T0HCP1/SSGI1	MRST	I	Main board power failure detection Edge interrupt
70	P25/INT5/T1IN/T0LCP/T0HCP	AVLIN	I	AV.Link input line
71	P26/INT5/T1IN/T0LCP/T0HCP	NC	O	
72	P27/INT5/T1IN/T0LCP/T0HCP	BLANKIN	I	BLANK signal input of the SCART
73	P30/PWM4	LED_DVD	O	Not used
74	P31/PWM5	TU_DCCON	O	DC/DC converter For +32V generation
75	P32/UTX1	TXD1	O	Transmission for RS-232C terminal
76	P33/URX1	RXD1	I	Reception for RS-232C terminal
77	P34/UTX2	TXD2	O	UART2 transmission Not used.
78	P35/URX2	RXD2	O	UART2 reception Not used.
79	P36	HS_TTOM	O	System controller communication handshake From tuner controller to system controller
80	VDDODA	VDDODA	–	Power supply

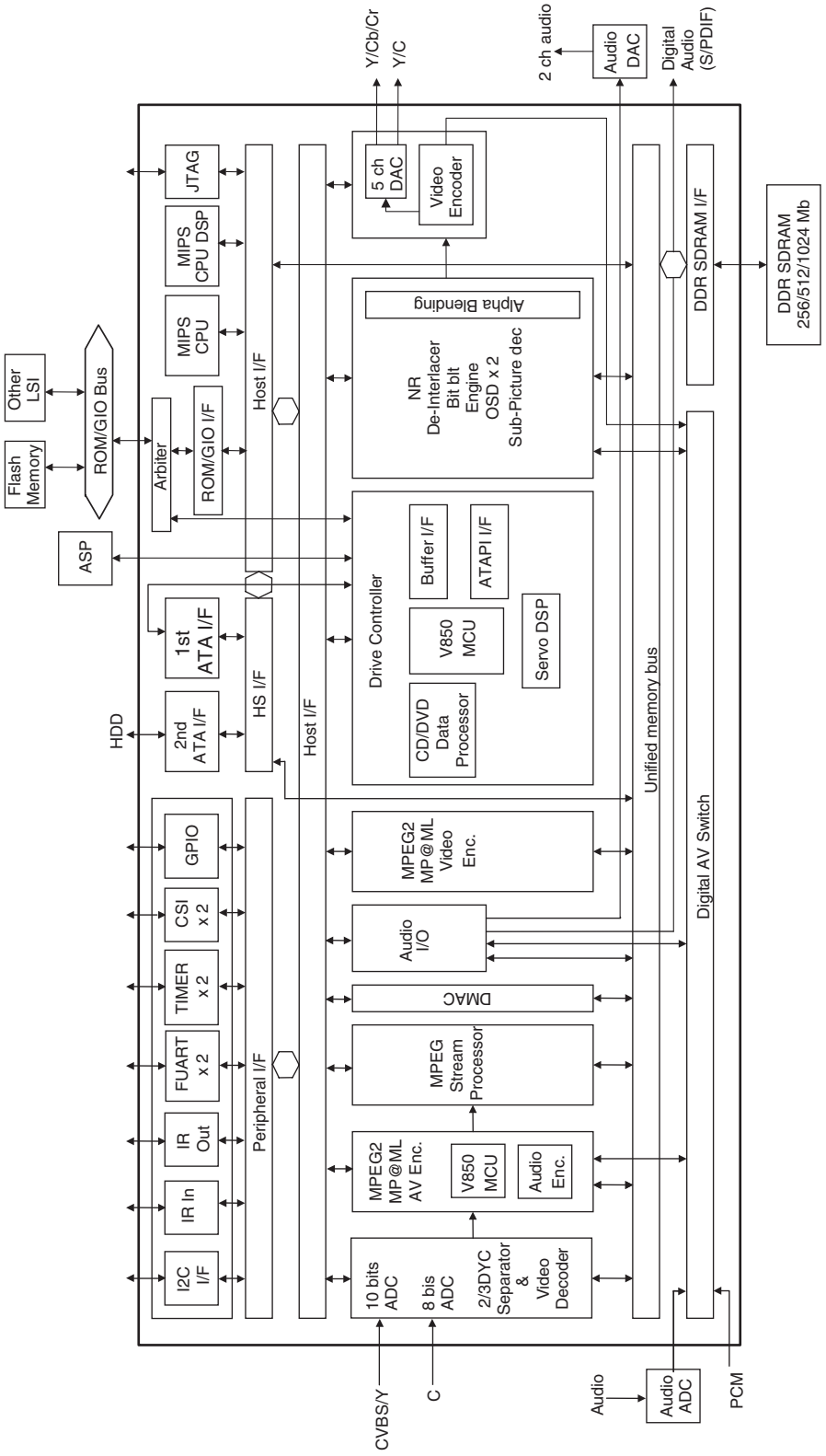
No.	Mark	Pin Name	I/O	Pin Function
81	PB6/CVD/CSYNC	CVBSIN	I	Input video for data slicer 1.0Vpp
82	VSSVCO	GND	–	Ground
83	PB4/FILTSLC	FILTSLC	I	External filter for slicer PLL
84	VDDVCO	VDDVCO	–	Power supply
85	PB2	NC	O	Non connection
86	PB1	NC	O	Non connection
87	PB0/DS1FLD	NC	O	Non connection
88	VSS3	GND	–	Ground
89	VDD3	VDD3	–	Power supply
90	PC7/DBGP2	DBGP2	O/D	Control port for on-chip debugger
91	PC6/DBGP1	DBGP1	O/D	Control port for on-chip debugger
92	PC5/DBGP0	DBGP0	O/D	Control port for on-chip debugger
93	PC4/AN11	LED_HDD	O	Not used
94	PC3/AN10	LEDHDD2	O	Not used
95	PC2/AN9	LED_COPY	O	Not used
96	PC1/AN8	LED_REC	O	Not used
97	PC0/OCSYNC	LED_ATV	O	Not used
98	PA0/SO7	SD_TTOM	O	System controller communication data line From tuner controller to system controller
99	PA1/SI7/SB7	SD_MTOT	I	System controller communication data line From system controller to tuner controller
100	PA2/SCK7	SCK_MTOT	I	System controller communication clock From system controller to tuner controller

■ UPD61272F1-107KA3A (MAIN ASSY : IC1001)

(EMMA2RFE)

• DVDR IC

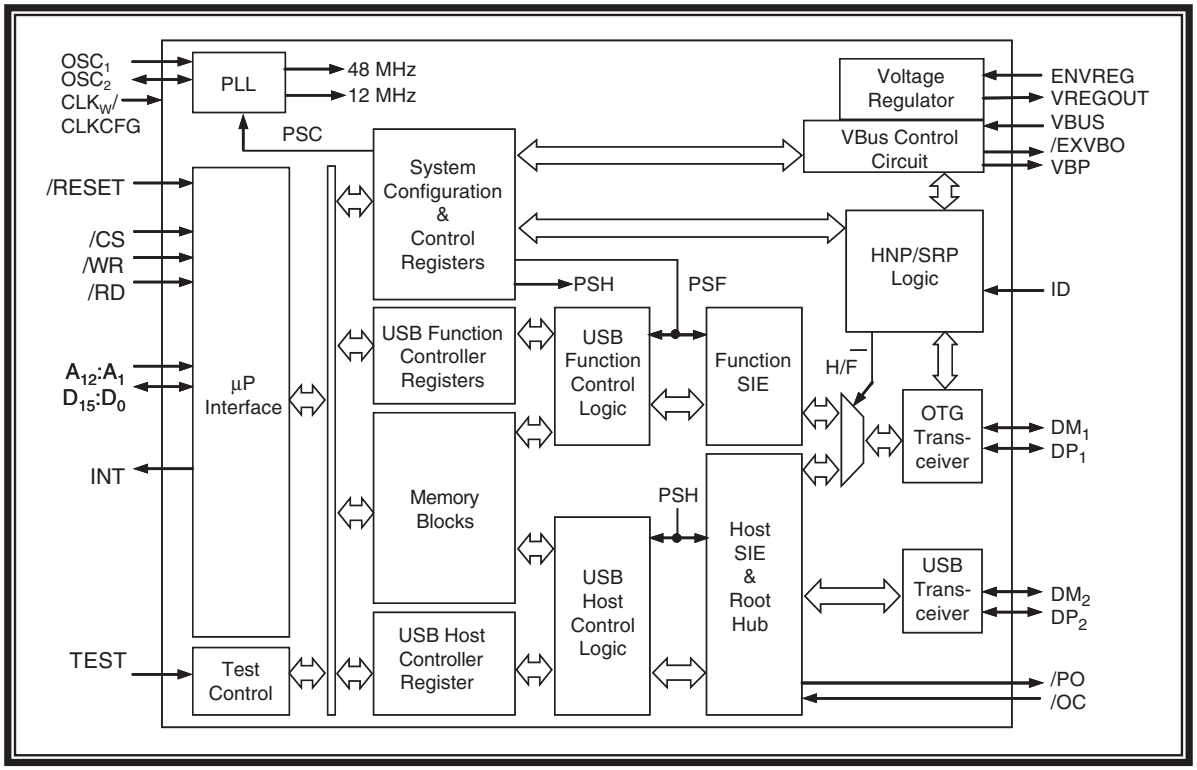
● BLOCK DIAGRAM



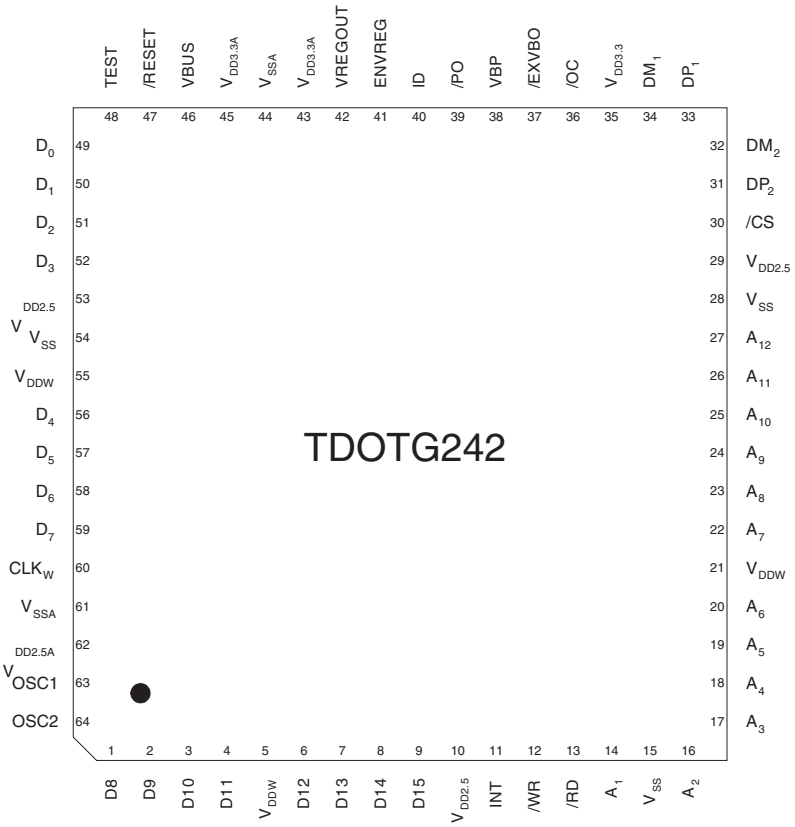
■ TDOTG242-0F0C8 (MAIN ASSY : IC5701)

• USB Controller IC

● BLOCK DIAGRAM



● **PIN LAYOUT**



● **PIN NAME**

1	D_8	17	A_3	33	DP_1	49	D_0
2	D_9	18	A_4	34	DM_1	50	D_1
3	D_{10}	19	A_5	35	$V_{DD3.3}$	51	D_2
4	D_{11}	20	A_6	36	/OC	52	D_3
5	V_{DDW}	21	V_{DDW}	37	/EXVBO	53	$V_{DD2.5}$
6	D_{12}	22	A_7	38	VBP	54	V_{SS}
7	D_{13}	23	A_8	39	/PO	55	V_{DDW}
8	D_{14}	24	A_9	40	ID	56	D_4
9	D_{15}	25	A_{10}	41	ENVREG	57	D_5
10	$V_{DD2.5}$	26	A_{11}	42	VREGOUT	58	D_6
11	INT	27	A_{12}	43	$V_{DD3.3A}$	59	D_7
12	/WR	28	Vss	44	V_{SSA}	60	CLK_W
13	/RD	29	$V_{DD2.5}$	45	$V_{DD3.3A}$	61	V_{SSA}
14	A_1	30	/CS	46	VBUS	62	$V_{DD2.5A}$
15	V_{SS}	31	DP_2	47	/RESET	63	OSC_1
16	A_2	32	DM_2	48	TEST	64	OSC_2

OTG242LP pin assignment for the 64-pin LQFP

- **PIN FUNCTION**

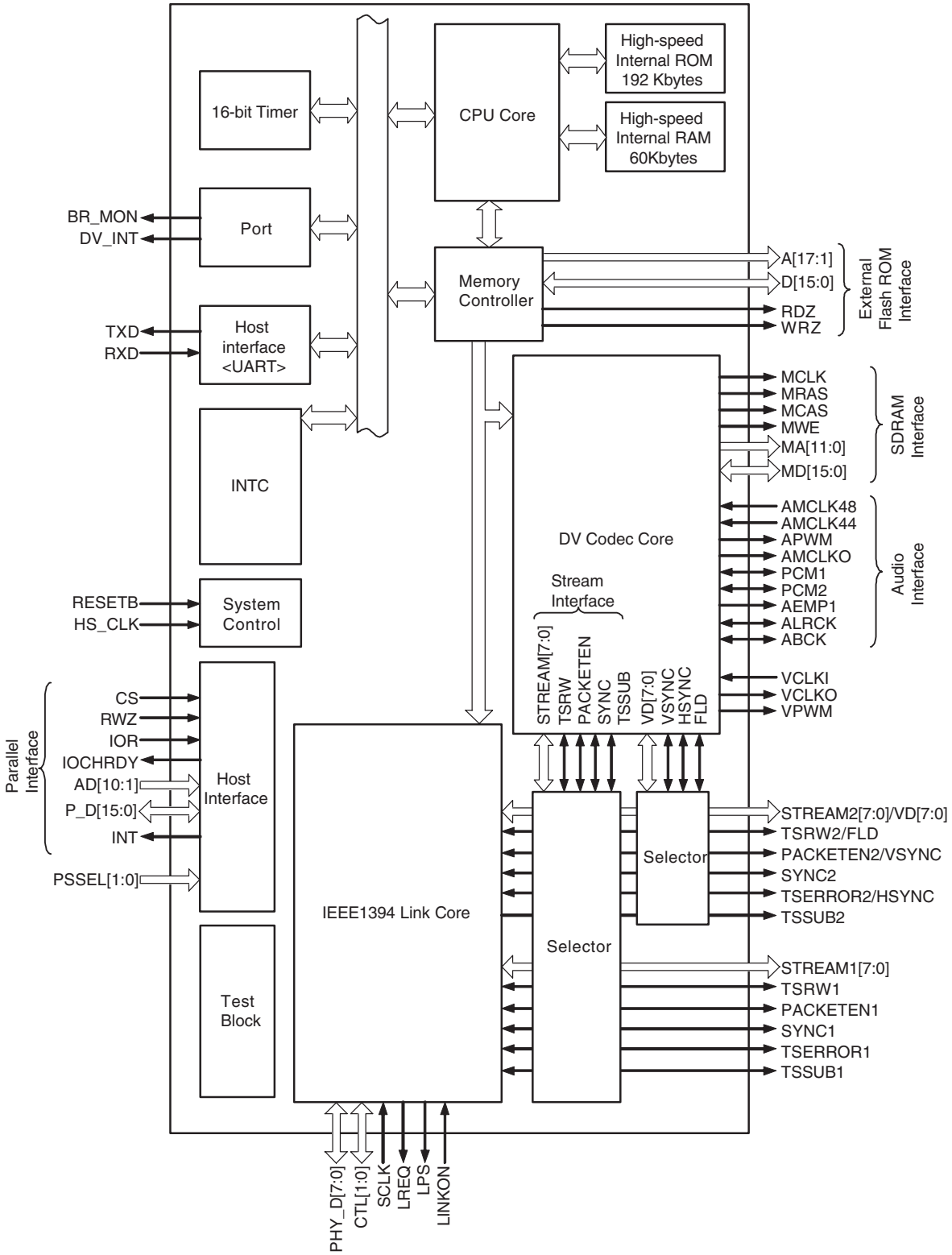
Pin/Signal Name	Signal Type	Active Level	Pin/Signal Description
OSC_1	I		Terminal for OSC.
OSC_2	IO		
/RESET	I	L	Hardware reset.
/CS	I	L	Chip select.
/WR	I	L	Write strobe.
/RD	I	L	Read strobe.
A_{12}:A_1	I		Address bus for an addressing space of 8K bytes.
D_{15}:D_0	IO		16-bit data bus.
TEST	I	H	Factory test mode.
/EXVBO	O	L	Turn on/off the external V_{BUS} (5V) for OTG operation (1: V_{BUS} off; 0: V_{BUS} on).
/PO	O	L	Turn on/off the gang power for all Host ports.
/OC	I	L	Over current condition indicator for gang powered Host ports.
INT[1]	O/WO	PL	Interrupt to the MCU.
ID	I		Connected to the ID pin of the mini-AB connector (Port 1) for OTG applications.
DM_1, DP_1	IO		Data lines for Port 1, which may serve as a USB Host, or OTG port.

Pin/Signal Name	Signal Type	Active Level	Pin/Signal Description
DM_2, DP_2	IO		Data lines for Port 2, a dedicated USB Host port.
VBUS	I		V_{BUS} input sampled during HNP/SRP operations by the OTG port.
VBP	IO	H	V_{BUS} pulsing control. This pin is used only when Port 1 is an OTG port for a B-DEVICE.
CLK_W	I		This pin is available only in the QFP package
CLKCFG	I		This pin is available only in the BGA package
ENVREG	I		Enables the internal Voltage Regulator if asserted.
VREGOUT	PW		Internal Voltage Regulator output of 2.5V
$V_{DD3.3A}$	PW		Analog +3.3V
$V_{DD2.5A}$	PW		Analog +2.5V
V_{SSA}	PW		Analog ground.
$V_{DD2.5}$	PW		Digital +2.5V
V_{DDW}	PW		Wide-range IO +3.3V or +2.5V.
V_{SS}	PW		Digital/Wide-range IO ground.
NC	PS		No connection. These pins should be left floating.

■ UPD72893BF1-FN3 (DVJB ASSY : IC102)

• DV-CODEC IC

● BLOCK DIAGRAM



● PIN LAYOUT

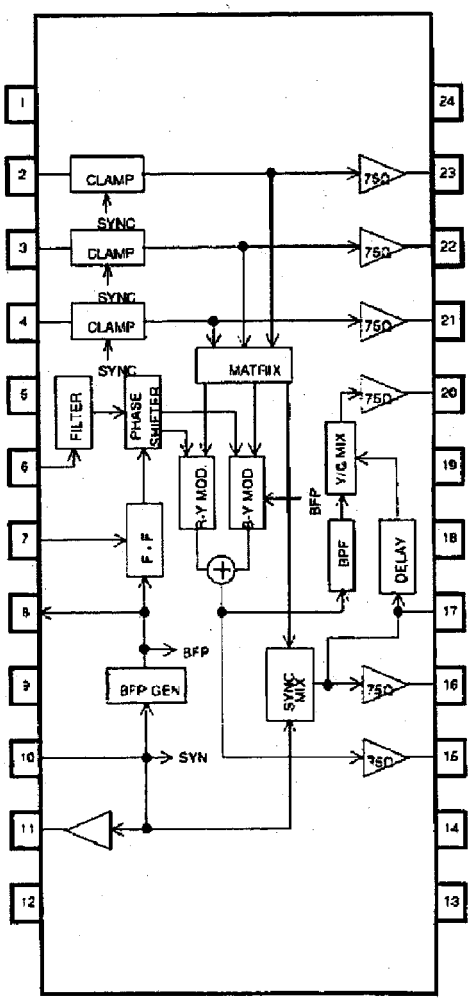
• 208-pin plastic FBGA (15x15)

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	T	U
17	A3	A2	A1	IC(PL)	3.3GND	2.5GND	3.3VDD	P_D9	P_D5	P_D2	INT	IOR	AD10	AD6	AD4	AD2	PSSEL1
16	A5	A4	BR_MON	IC(PH)	IC(PH)	P_D15	P_D12	P_D8	3.3GND	3.3VDD	IOCHRDY	RWZ	AD9	AD5	AD3	AD1	PSSEL0
15	A7	A6	IC (PL)	RXD	IC(PH)	P_D14	P_D11	P_D7	P_D4	P_D1	IC(O)	2.5VDD	AD8	AMCLKO	APWM	AMCLK44	AMCLK48
14	A9	A8	DV_INT	TXD	IC(PH)	P_D13	P_D10	P_D6	P_D3	P_D0	IC(H)	CS	AD7	PCM2	AEMP1	3.3GND	IC(O)
13	A12	A11	3.3VDD	A10										ALRCK	ABCK	3.3VDD	PCM1
12	A15	A14	2.5VDD	A13										MA9	MA10	2.5GND	MA11
11	RDZ	A17	A16	3.3GND										MA5	MA6	MA7	MA8
10	D2	D1	D0	WRZ										MA2	3.3GND	MA3	MA4
9	D6	D5	D4	D3										MCLK	3.3VDD	MA0	MA1
8	3.3GND	3.3VDD	D8	D7										MD15	MWE	MCAS	MRAS
7	D12	D11	D10	D9										MD11	MD12	MD13	MD14
6	D15	2.5GND	D14	D13										MD9	MD10	2.5VDD	3.3GND
5	PLLAGND	PLLAVDD	PLLDVDD	IC(L)										MD6	MD7	3.3VDD	MD8
4	HS_CLK	PLLDGND	RESETB	3.3VDD	3.3GND	CTL0	LPS	STREAM12	STREAM16	TSRW1	PACKETEN2/ VSYNC	SYNC2	STREAM21/ VD1	STREAM25/ VD5	AFS2	MD4	MD5
3	IC (PL)	IC (L)	PHY_D7	PHY_D4	PHY_D1	2.5VDD	LINKON	STREAM13	STREAM17	SYNC1	TSERROR2/ HSYNC	TSSUB2	STREAM22/ VD2	STREAM26/ VD6	VCLKI	MD2	MD3
2	IC (L)	IC (L)	PHY_D6	PHY_D3	PHY_D0	SCLK	STREAM10	STREAM14	PACKETEN1	3.3VDD	3.3GND	2.5GND	STREAM23/ VD3	STREAM27/ VD7	VCLKO	MD1	3.3GND
1	IC (H)	IC (L)	PHY_D5	PHY_D2	CTL1	LREQ	STREAM11	STREAM15T	SERROR1	TSSUB1	TSRW2/ FLD	STREAM20/ VD0	STREAM24/ VD4	AFS13	3.3VDD	VPWM	MD0

■ BH7236AF (SCRB ASSY : IC2000)

• Color TV Signal Encoder

● BLOCK DIAGRAM



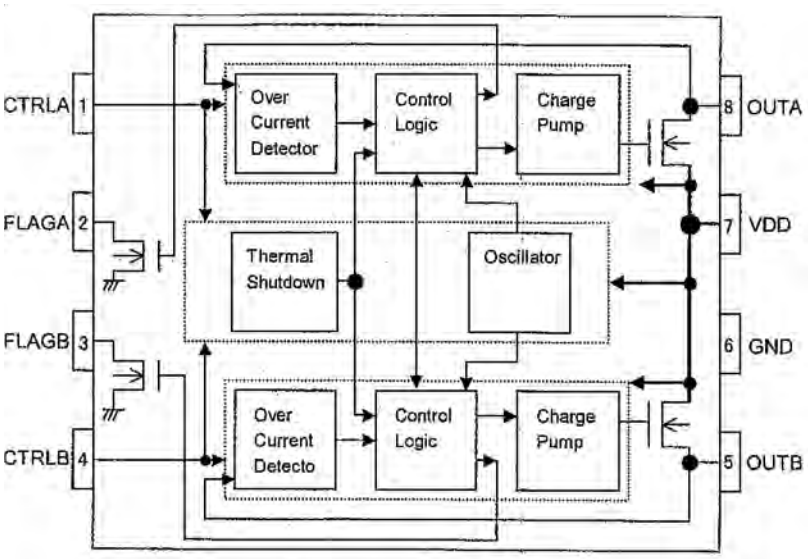
● PIN FUNCTION

Terminal No.	Terminal name	Description of terminals	Termina No.	Terminal name	Description of terminals
1	GND1	Ground terminal except 75Ω driver	13	N.C.	No Connection
2	RIN	Analog Red signal input terminal.	14	N.C.	No Connection
3	GIN	Analog Green signal input terminal.	15	COUT	Chroma signal output terminal.
4	BIN	Analog Blue signal input terminal.	16	YOUT	Luminance signal output terminal.
5	N.C.	No Connection	17	YTRAP	Luminance trap filter terminal.
6	SCIN	Color subcarrier input terminal.	18	N.C.	No Connection
7	NT/PAL	Input terminal for the selection of TV format.	19	VCC2	Power supply terminal for 75Ω driver.
8	BFPOUT	Burst timing signal output terminal.	20	VOUT	Composite video output terminal.
9	N.C.	No Connection	21	BOUT	Analog B signal output terminal.
10	SYNCIN	Composite sync input terminal.	22	GOUT	Analog G signal output terminal.
11	SYNCOUT	Composite sync output terminal.	23	ROUT	Analog R signal output terminal.
12	VCC1	Power supply terminal except 75Ω driver.	24	GND2	Ground terminal for 75Ω driver

BD6517F (MAIN ASSY: IC5631)

• High Side Switch

● Block Diagram



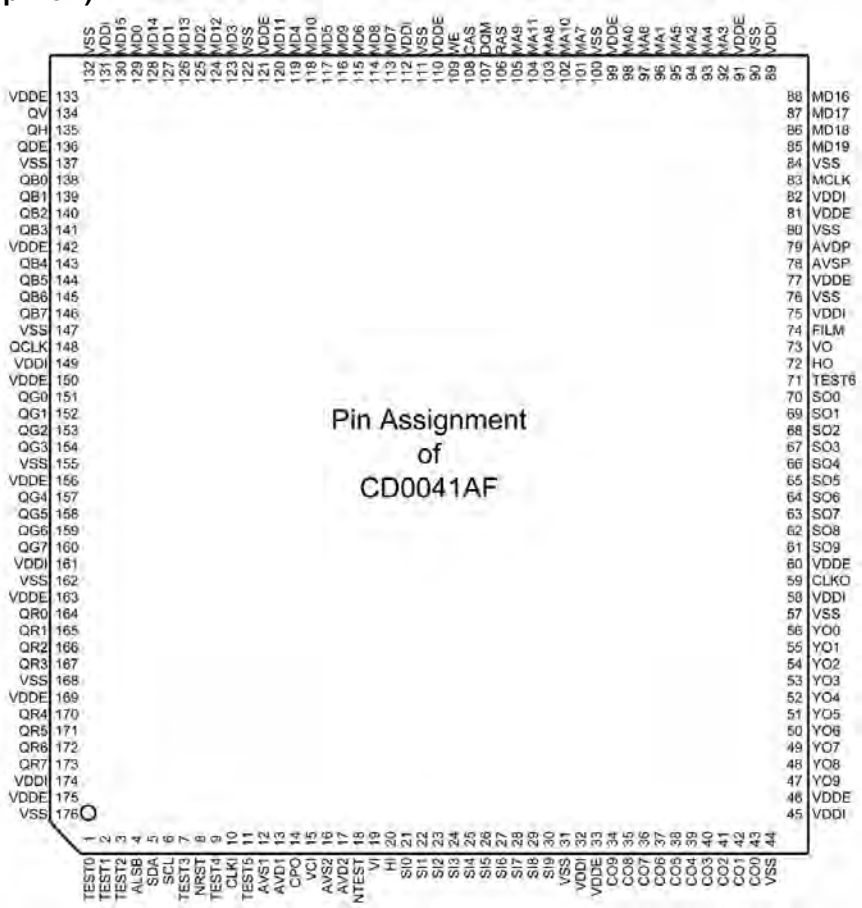
● Pin Function

No.	Pin Name	I/O	Function
1	CTRLA	I	Enable Input
2	FLAGA	O	Fault Flag Output
3	FLAGB	O	Fault Flag Output
4	CTRLB	I	Enable Input
5	OUTB	O	Switch Output
6	GND	–	Ground
7	VDD	–	Supply Input
8	OUTA	O	Switch Output

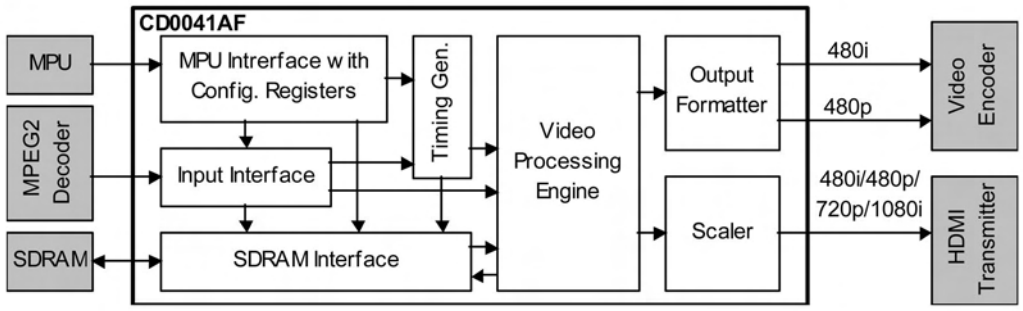
■ CD0041AF (HDMIB ASSY: IC101)

• SD to HD Scaler

● **Pin Arrangement (Top view)**



● **Block Diagram**



● **Pin Function**

No.	Pin Name	I/O	Function	No.	Pin Name	I/O	Function
1	TEST0	I	Test terminal	9	TEST4	I	Test terminal
2	TEST1	I	Test terminal	10	CLKI	I	27MHz clock input terminal
3	TEST2	I	Test terminal	11	TEST5	I	Test terminal
4	ALSB	I	IIC slave address setting terminal	12	AVS1	P	PLL1 only Analog Ground
5	SDA	I/O	IIC data in/out terminal	13	AVD1	P	PLL1 only Analog VDD (3.3V)
6	SCL	I	IIC clock input terminal	14	CPO	O	PLL1 charge pump output terminal
7	TEST3	I	Test terminal	15	VCI	I	PLL1 VCO input terminal
8	MRST	I	System reset input (Low Active)	16	AVS2	P	PLL1 only Analog Ground

No.	Pin Name	I/O	Function	No.	Pin Name	I/O	Function
17	AVD2	P	PLL1 only Analog GND	57	VSS	P	Digital GND
18	NTEST	I	TEST only input terminal	58	VDDI	P	VDD (1.8V) for Core
19	VI	I	Vertical Sync input terminal	59	CLKO	O	27MHz clock output terminal
20	HI	I	Horizontal Sync input terminal	60	VDDE	P	VDD (3.3V) for IO
21	SI0	I	ITU-R BT.656/601 input terminal (LSB)	61	SO9	O	ITU-R BT.656/601 output terminal (LSB)
22	SI1	I	ITU-R BT.656/601 input terminal	62	SO8	O	ITU-R BT.656/601 output terminal
23	SI2	I	ITU-R BT.656/601 input terminal	63	SO7	O	ITU-R BT.656/601 output terminal
24	SI3	I	ITU-R BT.656/601 input terminal	64	SO6	O	ITU-R BT.656/601 output terminal
25	SI4	I	ITU-R BT.656/601 input terminal	65	SO5	O	ITU-R BT.656/601 output terminal
26	SI5	I	ITU-R BT.656/601 input terminal	66	SO4	O	ITU-R BT.656/601 output terminal
27	SI6	I	ITU-R BT.656/601 input terminal	67	SO3	O	ITU-R BT.656/601 output terminal
28	SI7	I	ITU-R BT.656/601 input terminal	68	SO2	O	ITU-R BT.656/601 output terminal
29	SI8	I	ITU-R BT.656/601 input terminal	69	SO1	O	ITU-R BT.656/601 output terminal
30	SI9	I	ITU-R BT.656/601 input terminal (MSB)	70	SO0	O	ITU-R BT.656/601 output terminal (LSB)
31	VSS	P	Digital GND	71	TEST6	I	TEST terminal
32	VDDI	P	VDD (1.8V) for Core	72	HO	O	Horizontal Sync output terminal
33	VDDE	P	VDD (3.3V) for IO	73	VO	O	Vertical Sync output terminal
34	CO9	O	ANSI/SMPTE 293M output (Cb/Cr, MSB)	74	FILM	O	FILM detect flag output terminal
35	CO8	O	ANSI/SMPTE 293M output (Cb/Cr)	75	VDDI	P	VDD (1.8V) for Core
36	CO7	O	ANSI/SMPTE 293M output (Cb/Cr)	76	VSS	P	Digital GND
37	CO6	O	ANSI/SMPTE 293M output (Cb/Cr)	77	VDDE	P	VDD (3.3V) for IO
38	CO5	O	ANSI/SMPTE 293M output (Cb/Cr)	78	AVSP	P	PLL2 only Analog GND
39	CO4	O	ANSI/SMPTE 293M output (Cb/Cr)	79	AVDP	P	PLL1 only Analog VDD (1.8V)
40	CO3	O	ANSI/SMPTE 293M output (Cb/Cr)	80	VSS	P	Digital GND
41	CO2	O	ANSI/SMPTE 293M output (Cb/Cr)	81	VDDE	P	VDD (3.3V) for IO
42	CO1	O	ANSI/SMPTE 293M output (Cb/Cr)	82	VDDI	P	VDD (1.8V) for Core
43	CO0	O	ANSI/SMPTE 293M output (Cb/Cr, LSB)	83	MCLK	O	SDRAM clock output terminal (108MHz)
44	VSS	P	Digital GND	84	VSS	P	Digital GND
45	VDDI	P	VDD (1.8V) for Core	85	MD19	I/O	SDRAM data in/out terminal
46	VDDE	P	VDD (3.3V) for IO	86	MD18	I/O	SDRAM data in/out terminal
47	YO9	O	ANSI/SMPTE 293M output (Y, MSB)	87	MD17	I/O	SDRAM data in/out terminal
48	YO8	I	ANSI/SMPTE 293M output (Y)	88	MD16	I/O	SDRAM data in/out terminal
49	YO7	I	ANSI/SMPTE 293M output (Y)	89	VDDI	P	VDD (1.8V) for Core
50	YO6	I	ANSI/SMPTE 293M output (Y)	90	VSS	P	Digital GND
51	YO5	I	ANSI/SMPTE 293M output (Y)	91	VDDE	P	VDD (3.3V) for IO
52	YO4	I	ANSI/SMPTE 293M output (Y)	92	MA3	O	SDRAM address output terminal
53	YO3	I	ANSI/SMPTE 293M output (Y)	93	MA4	O	SDRAM address output terminal
54	YO2	I	ANSI/SMPTE 293M output (Y)	94	MA2	O	SDRAM address output terminal
55	YO1	I	ANSI/SMPTE 293M output (Y)	95	MA5	O	SDRAM address output terminal
56	YO0	I	ANSI/SMPTE 293M output (Y, LSB)	96	MA1	O	SDRAM address output terminal

No.	Pin Name	I/O	Function	No.	Pin Name	I/O	Function
97	MA6	O	SDRAM address output terminal	137	VSS	IP	Digital GND
98	MA0	O	SDRAM address output terminal (LSB)	138	QB0	O	Video data B output terminal (LSB)
99	VDDE	P	VDD (3.3V) for IO	139	QB1	O	Video data B output terminal
100	VSS	P	Digital GND	140	QB2	O	Video data B output terminal
101	MA7	O	SDRAM address output terminal	141	QB3	O	Video data B output terminal
102	MA10	O	SDRAM address output terminal	142	VDDE	P	VDD (3.3V) for IO
103	MA8	O	SDRAM address output terminal	143	QB4	O	Video data B output terminal
104	MA11	O	SDRAM address output terminal (MSB)	144	QB5	O	Video data B output terminal
105	MA9	O	SDRAM address output terminal	145	QB6	O	Video data B output terminal
106	RAS	O	SDRAM RAS command output	146	QB7	O	Video data B output terminal
107	DQM	O	SDRAM DQM output	147	VSS	P	Digital GND
108	CAS	O	SDRAM CAS command output	148	QCLK	O	Pixelclock output terminal
109	WE	O	SDRAM Write Enable command output	149	VDDI	P	VDD (1.8V) for Core
110	VDDE	P	VDD (3.3V) for IO	150	VDDE	P	VDD (3.3V) for IO
111	VSS	P	Digital GND	151	QG0	O	Video data G output terminal (LSB)
112	VDDI	P	VDD (1.8V) for Core	152	QG1	O	Video data G output terminal
113	MD7	I/O	SDRAM data in/out terminal	153	QG2	O	Video data G output terminal
114	MD8	I/O	SDRAM data in/out terminal	154	QG3	IO	Video data G output terminal
115	MD7	I/O	SDRAM data in/out terminal	155	VSS	P	Digital GND
116	MD6	I/O	SDRAM data in/out terminal	156	VDDE	P	VDD (3.3V) for IO
117	MD5	I/O	SDRAM data in/out terminal	157	QG4	O	Video data G output terminal
118	MD10	I/O	SDRAM data in/out terminal	158	QG5	O	Video data G output terminal
119	MD4	I/O	SDRAM data in/out terminal	159	QG6	O	Video data G output terminal
120	MD11	I/O	SDRAM data in/out terminal	160	QG7	O	Video data G output terminal (MSB)
121	VDDE	P	VDD (3.3V) for IO	161	VDDI	P	VDD (1.8V) for Core
122	VSS	P	Digital GND	162	VSS	P	Digital GND
123	MD3	I/O	SDRAM data in/out terminal	163	VDDE	P	VDD (3.3V) for IO
124	MD12	I/O	SDRAM data in/out terminal	164	QR0	I	Video data R output terminal
125	MD2	I/O	SDRAM data in/out terminal	165	QR1	O	Video data R output terminal
126	MD13	I/O	SDRAM data in/out terminal	166	QR2	O	Video data R output terminal
127	MD1	I/O	SDRAM data in/out terminal	167	QR3	O	Video data R output terminal
128	MD14	I/O	SDRAM data in/out terminal	168	VSS	P	Digital GND
129	MD0	I/O	SDRAM data in/out terminal	169	VDDE	P	VDD (3.3V) for IO
130	MD15	I/O	SDRAM data in/out terminal	170	QR4	O	Video data R output terminal
131	VDDI	P	VDD (1.8V) for Core	171	QR5	O	Video data R output terminal
132	VSS	P	Digital GND	172	QR6	O	Video data R output terminal
133	VDDE	P	VDD (3.3V) for IO	173	QR7	O	Video data R output terminal
134	QV	O	Vertical Sync output (for HDMI)	174	VDDI	P	VDD (1.8V) for Core
135	QH	O	Horizontal Sync output (for HDMI)	175	VDDE	P	VDD (3.3V) for IO
136	QDE	O	Data enable output terminal	176	VSS	P	Digital GND

7.3 CAUTIONS ON HANDLING THE HDD

(1) Cautions on Handling the HDD

- The HDD is very sensitive to shocks and vibrations. Care must be taken especially during operation (when the power is on).
- The HDD is very sensitive to electrostatic charges.
- Rapid change in temperature or humidity may cause deterioration of the HDD.

Note: After receiving damage caused by any above-mentioned factors, the HDD may operate normally for dozens or some hundreds of hours but then suddenly crash. If you are certain you have damaged a new repair part (HDD) while making repairs, do not use the part.

The HDD is about 10 times as sensitive to shock during operation than during nonoperation.

Reference: Main specifications on damage to the HDD

	During operation	During nonoperation
Shock G (acceleration)	<approx. 20 G	<approx. 200 G
Temperature change	< 15°C/hour	
Moisture change	< 20%/hour	

Reference: Estimate value of falling distance vs. shock (G) when the HDD is dropped without protection

Falling distance \ Landing surface	Granite surface	Concrete floor	Synthetic-resin-coated table	Antistatic sponge
0.5 inch / 12.7 mm	387	217	200	26
1.0 inch / 25.4 mm	595	457	310	37
2.0 inch / 50.8 mm	1133	600	680	70
4.0 inch / 101.6 mm	1795	1040	1050	267

(2) Cautions on handling the product on which the HDD is mounted or the HDD as a repair part, and examples of dangerous handling

[Cautions on handling the product on which the HDD is mounted]

- While the unit is turned on, the HDD is always in operation. Be sure NOT to impart shock to the unit.

● Examples of dangerous handling: while the power is on

- Bumping on the bonnet
- Dropping an object, such as a small screwdriver or remote control unit, onto the bonnet, or bumping an object against the cabinet
- Moving the unit by dragging
- Stacking another product on the unit

Note: Be sure NOT to impart shock, such as bumping or hitting a screwdriver against the HDD, during diagnosis with the bonnet open.

● Examples of dangerous handling: while the power is off

- Imparting strong shock, although the HDD is more resistant to shock when the power is off
- Dropping the unit from a height of several centimeters, or after lifting one side of the unit up, then letting the unit drop.

- Do NOT move the unit immediately after the power is turned off. Wait at least 30 seconds after the indication on the FL display changed from POWER OFF to the clock indication before moving the unit.
  If the AC power cord is accidentally disconnected before turning the unit off, wait at least for one minute before moving it. In this case, damage to the HDD caused by sudden shutoff may be small, because the emergency relief mechanism is activated. However, if sudden shutoff occurrs during recording or playback, recorded data may be damaged. Be sure to check operations.

[Cautions on handling the HDD as a repair part]

1. Handle the HDD in a safe environment:
   - Handle the HDD over an antistatic pad that can also absorb shock.
   - Wear wrist bands to prevent electrostatic charges generated in your body from affecting the HDD.

2. The following must be observed when handling the HDD:
   - Handle one HDD at a time. Do NOT hold several HDDs at the same time.
   - Grip the HDD on both sides so that you do not touch its terminals or circuit boards.
   - Do NOT stack one HDD onto another HDD (even if the HDDs are protected in antistatic bags).
   - Do NOT bump the HDDs against one another.
   - Do NOT bump any tool, such as a screwdriver, or other hard object against the HDD.
   - When a repair part (HDD) is transported and there is a large temperature difference between outdoors and indoors, to the indoor, leave it in its package for about a half day to gradually cool or warm the HDD to room temperature before unpacking it.

[Notes on packing for shipment]

- When returning a defective HDD for analysis, handle with care as if it were a good product. Otherwise, the results of analysis may not be correct.
- When packing, use the antistatic bag and packing materials in which the repair part for service was delivered. Attach a copy of the slip for service or a memo stating symptoms in as much detail as possible.

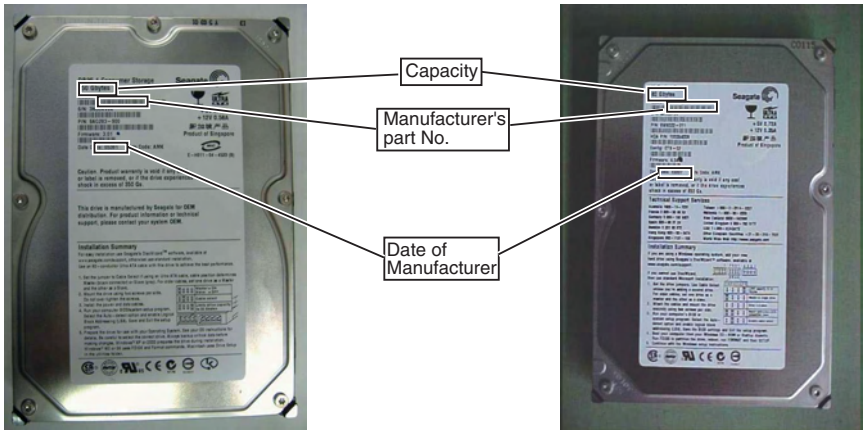
■ Outline and part No. of the HDDs

*Pioneer's part No. is not stamped.

Model Name	Capacity	SEAGATE	
		Pioneer's Part No. (for service)	Manufacture's Part No.
DVR-645H-S	250GB	VXF1082	ST3250823ACE
DVR-545H-S	160GB	VXF1110	ST3160212ACE

- When replacing the HDD, carefully check the capacity and manufacturer's part No. on the part label to avoid replacing with a similar but inappropriate product. You can also check the model No. of the mounted HDD on the Service mode screen.
- Do NOT use repair parts, such as commercially available HDDs, other than those designated above, as their functions, performance or reliability cannot be guaranteed.

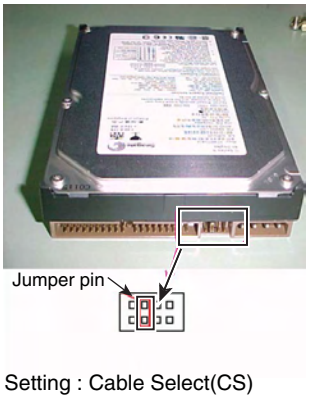
Seagate(250G)



Seagate(160G)

■ Confirmation of the jumper pin location of the HDD

Seagate



Setting : Cable Select(CS)

7.4 DISC/CONTENT FORMAT

	HDD	DVD-R		DVD-RW		DVD+R	DVD +RW	DVD-RAM
Marks used in this manual	HDD	DVD (VR) *1	DVD (Video)	DVD (VR) *1	DVD (Video) *2	DVD+R	DVD+RW	DVD-RAM *13, 16
Logos	HDD HARD DISK DRIVE	DVD R		DVD RW	DVD RW RW 2	RW DVD+R	RW DVD+ReWritable RW DVD+ReWritable High Speed	DVD RAM
Re-recordable / Erasable	●	● *3	● *3	●	●	*3	● *14	●
Editing of recorded programs	●	●	● *4	●	● *4	● *4	● *4	●
Recording of Copy-once protected material	●	● *12		● *12				● *12
Playback in other players/recorders	*n/a*	*5	● *6	● *7	● *6	● *6, 15	● *8	● *9
Chase play	●							
16:9 and 4:3 program recording	●	●		●				●
Bilingual broadcast recording of both audio channels	● *10, 11	● *11		● *11				● *11

Notes to table

**1 Must be initialized for VR mode recording*
**2 Must be initialized for Video mode recording*
**3 Erasable, but free space does not increase*
**4 Cannot erase sections, edit chapters or use playlist editing*
**5 Must be compatible with DVD-R(VR) playback*
**6 Finalize using this recorder (may not playback in some units)*
**7 Must be compatible with DVD-RW(VR) playback*
**8 Must be compatible with DVD+RW playback*
**9 Must be compatible with DVD-RAM playback*
**10 Only when HDD Recording Format is set to Video Mode Off*
**11 Only when the recording mode is not set to LPCM*
**12 CPRM-compatible discs only*
**13 Take the disc out of the cartridge before use. Only Matsushita and Maxell discs have been tested to work reliably with this recorder. Discs from other makers may become unusable when recorded or edited.*
**14 Erasing a title does not increase the available recording time, nor increase the number of recordable titles left.*
**15 Must be compatible with DVD+R playback*
**16 Depending on the disc, it may have to be initialized before it can be recorded. In this case, initialization will take about 1 hour.*

DVD is a trademark of DVD Format/Logo Licensing Corporation.

Using DVD-R DL/DVD+R DL discs

DVD-R DL (dual-layer) and DVD+R DL (double-layer) discs contain two recordable layers on a single side, giving about 1.8 times the recording capacity of a conventional single-layer disc. This unit can record to both DVD-R DL and DVD+R DL discs.

- If you intend to play DVD-R DL (Video mode) or DVD+R DL discs recorded on this unit on other DVD recorders/players, you must finalize them. (Note that some DVD recorders/players may not play even finalized DL discs.)
- Please read the information provided on the disc packaging carefully before purchasing DVD-R DL/DVD+R DL discs:
- *Confirm the disc version:* Use ver. 3.0 / 2 x to 4 x DVD-R discs.
- *Confirm the recording speed :* DVD-R should be compatible with 2 x or 4 x recording; DVD+R with 2.4 x to 8 x recording.
- This logo indicates that the disc is a DVD-R DL or DVD+R DL disc:

DVD R DL 4X/2X RW DVD+R DL

- Correct operation has been confirmed for DVD-R DL discs (Ver. 3.0 / 2 x, 4 x) produced by the following manufacturers: Mitsubishi Kagaku Media, Verbatim (as of March 2005).

About DualDisc playback

A DualDisc is a new two -sided disc, one side of which contains DVD content -video, audio, etc. -while the other side contains non-DVD content such as digital audio material.
The non-DVD, audio side of the disc is not compliant with the CD Audio specification and therefore may not play.
It is possible that when loading or ejecting a DualDisc, the opposite side to that being played will be scratched. Scratched discs may not be playable.

The DVD side of a DualDisc plays in this product. DVD-Audio content will not play.

For more detailed information on the DualDisc specification, please refer to the disc manufacturer or disc retailer.

Other disc compatibility

In addition to DVD, this recorder is compatible with a wide range of disc types (media) and formats. Playable discs will generally feature one of the following logos on the disc and/or disc packaging. Note however that some disc types, such as recordable CD (and DVD), may be in an unplayable format - see below for further compatibility information.

CD-R/RW compatibility

This recorder cannot record CD-R or CD-RW discs.

- Readable formats: CD-Audio, Video CD/ Super VCD, ISO 9660 CD-ROM* containing MP3, WMA, JPEG or DivX files.
  ** ISO 9660 Level 1 or 2 compliant. CD physical format: Mode1, Mode2 XA Form1. Romeo and Joliet file systems are both compatible with this recorder.*
- Multi-session playback: Yes (except CD-Audio and Video CD/Super VCD)
- Unfinalized disc playback: CD-Audio only

Compressed audio compatibility

- Compatible media: CD-ROM, CD-R, CD-RW
- Compatible formats: MPEG-1 Audio Layer 3 (MP3), Windows Media Audio (WMA)
- Sampling rates: 32 kHz, 44.1 kHz or 48 kHz
- Bit-rates: Any (128 Kbps or higher recommended)
- Variable bit-rate (VBR) MP3 playback:Yes
- VBR WMA playback: No
- WMA encoder compatibility: Windows Media Codec 8*(files encoded using Windows Media Codec 9 may be playable but some parts of the specification are not supported; specifically, Pro, Lossless, Voice and VBR)*
- DRM (Digital Rights Management)[1] file playback: No
- File extensions: .mp3, .wma (these must be used for the recorder to recognize MP3 and WMA files - do not use for other file types)
- File structure: Up to 99 folders / 999 files (if these limits are exceeded, only files and folders up to these limits are playable)

WMA (Windows Media Audio) compatibility

The Windows Media® logo printed on the box indicates that this recorder can playback Windows Media Audio content.

WMA is an acronym for Windows Media Audio and refers to an audio compression technology developed by Microsoft Corporation. WMA content can be encoded by using Windows Media® Player for Windows® XP, Windows Media® Player 9 or Windows Media® Player 10 series.

Microsoft, Windows Media, and the Windows logo are trademarks, or registered trademarks of Microsoft Corporation in the United States and/or other countries.

DivX video compatibility

DivX is a compressed digital video format created by the DivX® video codec from DivX, Inc. This recorder can play DivX video files burned on CD-R/RW/ROM discs. Keeping the same terminology as DVD-Video, individual DivX video files are called "Titles." When naming files/titles on a CD-R/RW disc prior to burning, keep in mind that by default they will be played in alphabetical order.

- Official DivX® Certified product.
- Plays all versions of DivX® video (including DivX® 6) with standard playback of DivX® media files.
- File extensions: .avi and .divx (these must be used for the recorder to recognize DivX video files). *Note that all files with the .avi extension are recognized as MPEG4, but not all of these are necessarily DivX video files and therefore may not be playable on this recorder.*
- File structure: Up to 99 folders or 999 files.

DivX, DivX Certified, and associated logos are trademarks of DivX, Inc. and are used under license.

DivX® VOD content

DivX

In order to play DivX VOD (video on demand)

Note

1 DRM (digital rights management) copy protection is a technology designed to prevent unauthorized copying by restricting playback, etc. of compressed audio files on devices other the PC (or other recording equipment) used to record it. For detailed information, please see the instruction manuals or help files that came with your PC (or other WMA recording equipment) and/or software.

content on this recorder, you first need to register the recorder with your DivX VOD content provider. You do this by generating a DivX VOD registration code, which you submit to your provider.

Some DivX VOD content may only be playable a fixed number of times. When you load a disc containing this type of DivX VOD content, the remaining number of plays is shown on-screen and you then have the option of playing the disc (thereby using up one of the remaining plays), or stopping. If you load a disc that contains expired DivX VOD content (for example, content that has zero remaining plays), the message **Rental Expired** is displayed.

If your DivX VOD content allows an unlimited number of plays, then you may load the disc into your recorder and play the content as often as you like, and no message will be displayed.

Important

- DivX VOD content is protected by a DRM (Digital Rights Management) system. This restricts playback of content to specific, registered devices.
- If you load a disc that contains DivX VOD content not authorized for this recorder, the message **Authorization Error** is displayed and the content will not play.
- Resetting the recorder will not cause you to lose your registration code.

JPEG file compatibility

- Compatible formats: Baseline JPEG and EXIF 2.2* still image files
  * *File format used by digital still cameras*
- Sampling ratio: 4:4:4, 4:2:2, 4:2:0
- Horizontal resolution: 160 to 5120 pixels
- Vertical resolution: 120 to 3840 pixels
- Progressive JPEG compatible: No
- File extensions: .jpg, .jpeg, .jpe, .jif, .jfif (must be used for the recorder to recognize JPEG files - do not use for other file types)
- File structure: The recorder can load up to 99 folders / 999 files at one time*(if there are more files/folders that this on the disc then more can be reloaded)*

PC-created disc compatibility

Discs recorded using a personal computer may not be playable in this unit due to the setting of the application software used to create the disc. In these particular instances, check with the software publisher for more detailed information.

Discs recorded in packet write mode (UDF format) are not compatible with this recorder.

Check the DVD-R/RW or CD-R/RW software disc boxes for additional compatibility information.

Dolby Digital

Manufactured under license from Dolby Laboratories. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories.

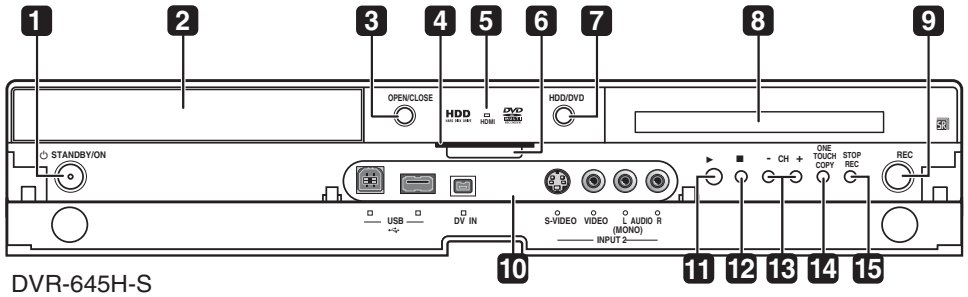
DTS

“DTS” and “DTS Digital Out” are registered trademarks of Digital Theater Systems, Inc.

8. PANEL FACILITIES

8.1 FRONT SECTION

Front panel



DVR-645H-S

1 ⏻ STANDBY/ON
Press to switch the recorder on/into standby.

2 Disc tray

3 ⏏ OPEN/CLOSE
Press to open/close the disc tray.

4 HDD / DVD indicators
Indicator lights blue when the hard disk (HDD) is selected; orange when the DVD drive is selected.

5 HDMI indicator
Lights when this recorder is connected to HDMI (HDCP) compatible component.

6 PAUSE LIVE TV
Press to start recording the current TV channel, but with playback paused, effectively pausing the broadcast.

7 HDD/DVD
Press to switch between HDD and DVD for recording and playback.

8 Front panel display and IR remote sensor

9 ● REC
Press to start recording. Press repeatedly to set the recording time in 30 minute blocks.

10 Front panel inputs
See below.

11 ►
Press to start or restart playback.

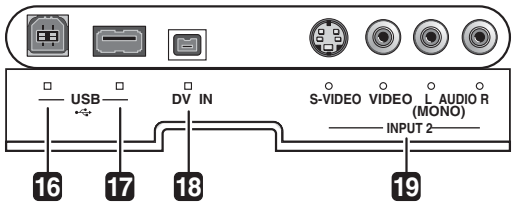
12 ■
Press to stop playback.

13 CH +/–
Use to change channels, skip chapters/ tracks, etc.

14 ONE TOUCH COPY
Press to start One Touch Copy of the currently playing title to DVD or the HDD.

15 STOP REC
Press to stop recording.

Front panel inputs



16 USB port (Type B) (DVR-645H-S only)
USB port for connecting a PictBridge-compatible printer.

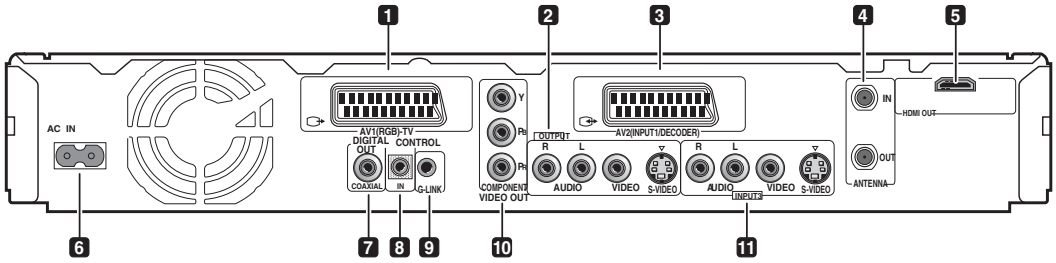
17 USB port (Type A) (DVR-645H-S only)
USB port for connecting a digital camera, USB memory or other USB device.

18 DV IN (DVR-645H-S only)
A DV input i.LINK connector, suitable for connecting a DV camcorder.

19 INPUT 2
Audio/video input (stereo analog audio; composite and S-video), especially suitable for camcorders, game consoles, portable audio, etc.

8.2 REAR PANEL section

Rear panel



1 AV1(RGB)-TV AV connector
Audio/video output SCART-type AV connector for connecting to a TV or other equipment with a SCART connector. The video output is switchable between video, S-video and RGB.

2 OUTPUT
Stereo analog audio, video and S-video outputs for connection to a TV or AV amplifier/receiver.

3 AV2(INPUT 1/DECODER) AV connector
Audio/video input/output SCART-type AV connector for connecting to a VCR, or other equipment with a SCART connector. The input accepts video, S-video and RGB.

4 ANTENNA IN (RF IN)/OUT
Connect your TV antenna to the **ANTENNA IN (RF IN)** jack. The signal is passed through to the **ANTENNA OUT** jack for connection to your TV.

5 HDMI OUT
HDMI output for high quality digital audio and video.

6 AC IN – Power inlet

7 DIGITAL AUDIO OUT
Coaxial digital audio jack for connecting to an AV amplifier/receiver, Dolby Digital/DTS/MPEG decoder or other equipment with a digital input.

8 CONTROL IN
Use to control this recorder from the remote sensor of another Pioneer component with a **CONTROL OUT** terminal and bearing the Pioneer SR mark. Connect the **CONTROL OUT** of the other component to the **CONTROL IN** of this recorder using a mini-plug cord.

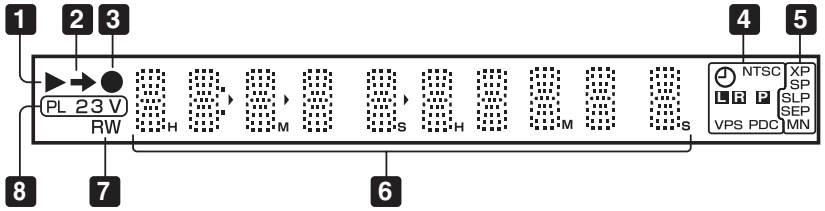
9 G-LINK™
Use to connect the supplied G-LINK™ cable to enable GUIDE Plus+™ to control an external satellite receiver, etc.

10 COMPONENT VIDEO OUT
A high-quality video output for connecting to a TV or monitor with a component video input.

11 INPUT 3
Stereo analog audio, video and S-video inputs for connection to a VCR or other source component.

8.3 DISPLAY

Display



1 ▶
Lights during playback; blinks when playback is paused.

2 ➡
Lights when copying.

3 ●
Lights during recording; blinks when recording is paused.

4 ⏲
Lights when a timer recording has been set. (Indicator blinks if the timer has been set to DVD but there isn't a recordable disc loaded, or the timer has been set to HDD but the HDD is not recordable.)

NTSC
Lights when the video output signal format is NTSC.

L R
Indicates which channels of a bilingual broadcast are recorded.

P
Lights when the component video output is set to progressive scan.

VPS / PDC
Lights when receiving a VPS/PDC broadcast during a VPS/PDC-enabled timer recording.

5 Recording quality indicators

XP
Lights when the recording mode is set to **XP** (best quality).

SP
Lights when the recording mode is set to **SP** (standard play).

LP / SLP
Lights when the recording mode is set to **LP** (long play) or **SLP** (super-long play).

EP / SEP
Lights when the recording mode is set to **EP** (extended play) or **SEP** (super-extended play).

MN
Lights when the recording mode is set to **MN** (manual recording level) mode.

6 Character display

7 R / RW
Lights when a recordable DVD-R or DVD-RW disc is loaded.

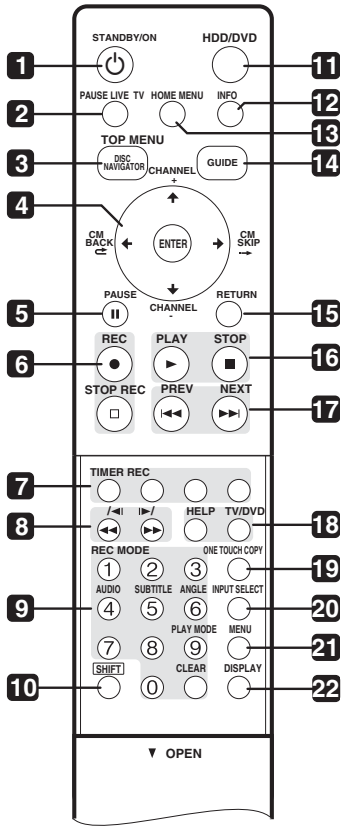
8 PL
Lights when a VR mode disc is loaded and the recorder is in Play List mode.

2 3
Shows the remote control mode (if nothing is displayed, the remote control mode is 1).

V
Lights when an unfinalized Video mode disc is loaded.

8.4 REMOTE CONTROL

Remote control



1 ⏻ STANDBY/ON
Press to switch the recorder on/into standby.

2 PAUSE LIVE TV
Press to start recording the current TV channel, but with playback paused, effectively pausing the broadcast.

3 DISC NAVIGATOR/ TOP MENU
Press to display the Disc Navigator screen, or the top menu if a DVD-Video or finalized DVD-R/RW (Video) disc is loaded.

4 ⬆/⬇/⬅/➡ and ENTER
Used to navigate all on-screen displays. Press **ENTER** to select the currently highlighted option.

CM BACK (commercial back)
Press repeatedly to skip progressively backward through the audio or video playing.

CM SKIP (commercial skip)
Press repeatedly to skip progressively forward through the audio or video playing.

CHANNEL +/–
Press to change the channel of the built-in TV tuner.

5 ⏸ PAUSE
Press to pause playback or recording.

6 Recording controls

● REC
Press to start recording. Press repeatedly to set the recording time in blocks of 30 mins.

When the red action button is visible in a GUIDE Plus+™ screen, use for One-Button-Record.

STOP REC
Press to stop recording.

7 GUIDE Plus+™ Action buttons
When in the GUIDE Plus+™ system, these buttons act as the Red, Green, Yellow and Blue Action buttons (the functions of these buttons change according to the GUIDE Plus+™ Area.

TIMER REC
Hold **SHIFT** and press to set a timer recording from the GUIDE Plus+™ system.

8 ◄◄ ►►
Press to start reverse or forward scanning. Press again to change the speed.

◄II/◄I I►/II►
While paused, press and hold to start slow-motion playback. Press repeatedly to change the playback speed.

While paused, press to advance a single frame in either direction.

When GUIDE Plus+™ is displayed, use to display the previous/next day.

9 Number buttons, CLEAR
Use the number buttons for track/chapter/title selection; channel selection, and so on. The same buttons can also be used to enter names for titles, discs and so on.

Use **CLEAR** to clear an entry and start again.

REC MODE
Hold **SHIFT** and press repeatedly to change the recording mode (picture quality).

AUDIO
Hold **SHIFT** and press to change the audio language or channel. (When the recorder is stopped, press to change the tuner audio.)

SUBTITLE
Hold **SHIFT** and press to display/change the subtitles included in multilingual DVD-Video discs.

ANGLE
Hold **SHIFT** and press to switch camera angles on discs with multi-angle scenes.

PLAY MODE
Hold **SHIFT** and press to change the play mode (search, repeat, program play, etc.)

10 SHIFT
Use to access functions on the remote printed in green.

11 HDD/DVD
Press to select the hard disk (HDD) or DVD for recording and playback.

12 INFO
Press to see additional information for the highlighted item in GUIDE Plus+™.

13 HOME MENU
Press to display the Home Menu, from which you can navigate all the functions of the recorder.

14 GUIDE
Press to display the GUIDE Plus+™ screen; press again to exit.

15 RETURN
Press to go back one level in the on-screen menu or display.

16 ► PLAY
Press to start playback.

■ STOP
Press to stop playback.

17 I◄◄ ►►I
Press to skip to the previous or next title/chapter/track/folder; or to display the previous or next menu page.

When GUIDE Plus+™ is displayed, use to display the previous/next page.

18 HELP
Press for help on how to use the current GUI screen.

TV/DVD
Press to switch between 'TV mode', in which you get the picture and sound from the TV's tuner, and 'DVD mode', in which you get picture and sound from the recorder's tuner (or an external input).

19 ONE TOUCH COPY
Press to start One Touch Copy of the currently playing title to DVD or the HDD.

20 INPUT SELECT
Press to change the input to use for recording.

21 MENU
Press to display the disc menu if a DVD-Video, finalized DVD-R/-RW or finalized DVD+R/+RW disc is loaded.

When in the GUIDE Plus+™ system, use to jump directly to the Menu bar.

22 DISPLAY
Displays/changes the on-screen information displays.

A

B

C

D

E

F

■ Jigs list

Name	Jig No.	Remarks
Service Remote Control Unit	GGF1381	Adjustment, diagnosis
DVD Test Disc (DVD-Video)	GGV1025	Check of DVD-Video
DVD Recorder Data Disc Type2	———— (*)	Diagnosis (ID data setting)
Flexible Cable (35P)	GGD1478	Diagnosis of MAIN Assy
4P Power Cable	VKP2291	Extension of HDD
Jig for LD Power Adjustment	GGF1559	LD Power Adjustment
FFC Cable (10P)	GGD1477	LD Power Adjustment
CD-ROM Test Disc	GGV1054	LD Power Adjustment
DVD Dual Layer Test Disc	GGV1036	LD Power Adjustment

(*) Be sure to use the latest disc (Type 2).
In May, 2006, the latest disc is GGV1273.

■ Lubricants and Glues list

Name	Lubricants and Glues No.	Remarks
Hanarl	GEM1041	refer to "2.3 FRONT PANEL SECTION"

Before shipping out the product, be sure to clean the following positions by using the prescribed cleaning tools:

Position to be cleaned	Cleaning tools
Pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

Position to be cleaned	Cleaning tools
Fans	Cleaning paper : GED-008